

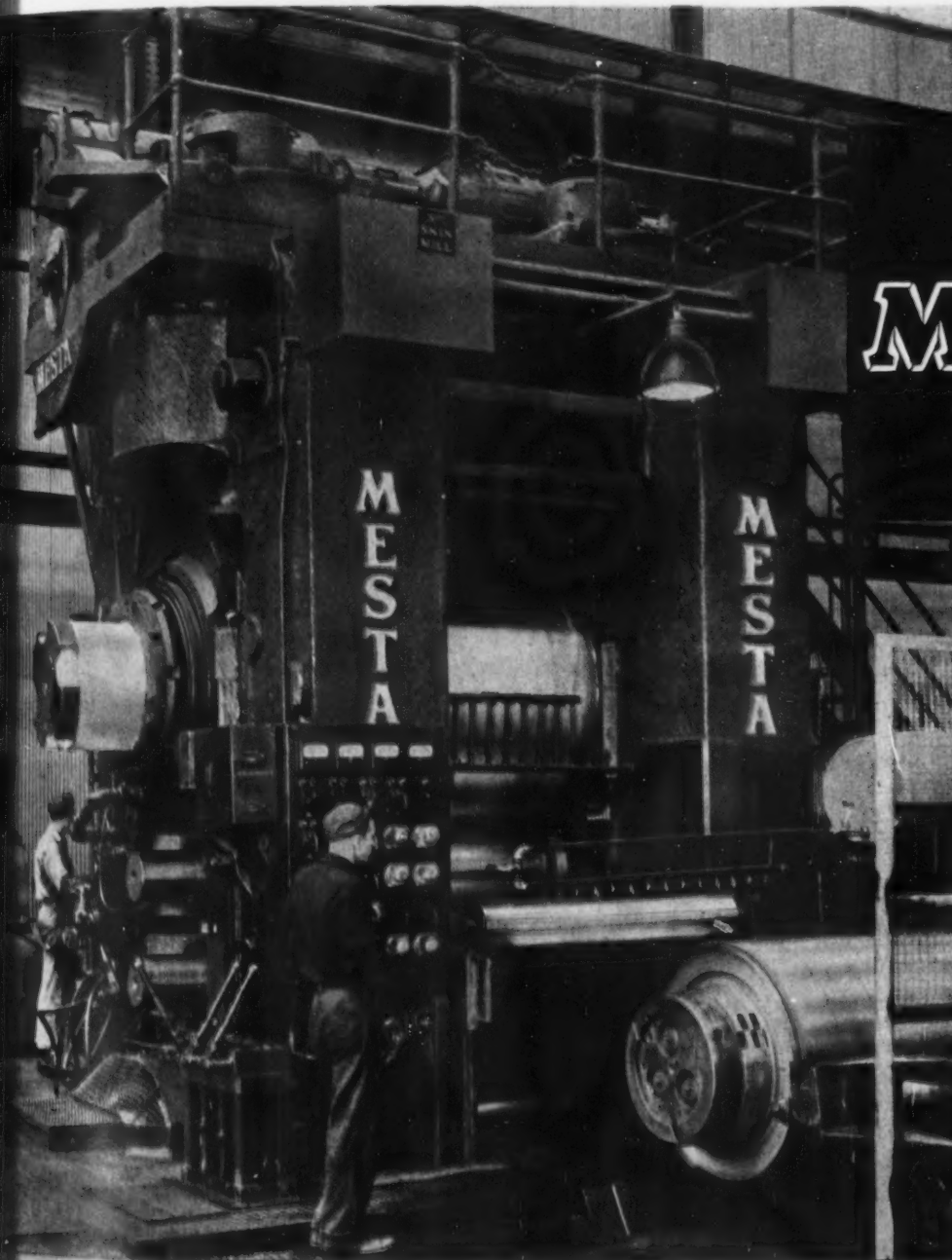
The **Iron Age**

A CHILTON PUBLICATION

THE NATIONAL METALWORKING WEEKLY

June 21, 1951

CONTENTS PAGE 2



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BETHLEHEM WELDMENTS

June 21, 1951

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JUNE 21, 1951

IRON AGE

VOL. 167 NO. 25

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IRON AGE *summary*

*iron and steel
industry trends*

Steel supply growing tighter . . . Growth of defense and supporting programs is the reason . . . Scrap and labor are twin concerns

No More Kidding—Steel supply is not going to get better. It is getting worse and will continue to grow more critical in the final months of this year and the first quarter of 1952. Anyone who had been hoping for an improvement is doomed to disappointment. Even Government officials are now beginning to talk facts, although some of their statements are still misleading. The day for double-talk is over because steel consumers can no longer be kidded.

Writing Is on the Wall—Automobile producers may be forced to cut back production further in the third quarter. They won't do so willingly, so when their production drops it will be all the more significant. Reason for their cutbacks will be lack of critical metal items, particularly alloy and carbon bars. A leading producer of carbon bars says more than 90 pct of his output will be controlled in August. The picture is even worse for plates and structurals. The chances are that less than 15 pct of finished steel will be available for non-essential uses in the third quarter.

Day of Reckoning—As bad as this sounds, it is even worse when it is realized that the supply of individual steel items will be out of balance. It does a fabricator no good to have his sheets but lack his bars. His plant is just as idle as though he had neither.

The day of reckoning on alloy steel is here. Before the end of the year there probably will be none available for civilian uses. Even some military orders have been downgraded to the substitute boron steels. Those consumers who have not investigated use of the boron types will be forced to do so within 30 days.

CMP Will Help Little—First quarter 1952 shapes up this way: Direct defense production will be shifting into high gear, will grow in volume as the year advances; with this increase will come a growth in subcontracting as prime producers seek to step up their production.

National Production Authority's decision to include consumer hard goods manufacturers under the Controlled Materials Plan in fourth quarter will hardly improve the supply situation for these fabricators. It may assure them of a supply, but they know before the time comes that the amount available to them is going to be plenty skimpy.

Dismal Scrap Picture—Another fact overlooked in the discussion of increasing steel capacity and its effect on the supply picture is the situation in scrap. Steel producers are more concerned than they care to admit. The fact that they have been able to maintain production at the present record-breaking pace is a tribute to both the producers and the scrap industry. But this cannot go on. Everybody is afraid of the coming winter. While scrap is moving freely today, the mills are virtually living hand-to-mouth and have not been able to make any progress toward building up their inventories. The prospect is that further production cutbacks are inevitable.

Labor Restlessness—Steel labor is becoming a bit restive. Union leaders are having a tough time. Restlessness is reflected in worker slowdowns and in increasing volume of grievances over incentive rates. Union officials are concerned about inflation. Steel workers are not impressed by slight drop in cost of living index when the butcher asks 90¢ for a pound of stewing beef.

When the time comes next November, Phil Murray is going to ask for higher wages, maybe 15¢ or more an hour. Steel industry won't be able to grant it without a price increase. Before the dust settles, the case may follow an old, familiar pattern of (1) demand, (2) refusal, (3) fact-finding board, (4) strike, and (5) settlement with subsequent price relief.

The ingot rate this week is 103.5 pct of rated capacity, unchanged from last week.

(Nonferrous summary, p. 156)



Tubing troubles got your goat?



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machine tool high spots

*sales
inquiries
and
production*

by W.A. Lloyd



Pricing Relief—What amounted to Washington neglect of the crucial machine tool industry appears to be nearing a belated end. OPS was readying a special pricing order to remove builders from under the shadow of CPR 30. The order should have been issued early this week, according to reliable reports which allowed for the usual period of desk-shuttling.

The new OPS order reportedly grants cost recognition to: (1) Overtime payments, (2) increases in shift premiums, (3) subcontracting costs, and (4) gives the right to redetermine ceiling prices as additional costs show up.

Natural Outlet—Machine tool builders are usually a confident bunch. They know they can match up to the astronomical demands of a war economy if given half a chance. They did it before in World War II. But this time the breaks were not thrown their way. They were deprived of priorities to get materials and told they would have to bear overtime and subcontracting costs.

Natural outlet for an industry that cannot afford to chance adding vast new capacity to meet unusual but temporary demand is overtime and subcontracting. Thus Washington edicts hit where they did the most damage.

Little Subcontracting—To date, there has been relatively little sub-

contracting by the industry mainly because builders can make little profit due to the pricing situation.

Nobody claims to know the extent of the industry's order backlog. One estimate is 2 years' worth. Some builders will not book additional orders but will merely acknowledge receipt of orders. Builders also know the worst is not yet here. Relatively few of the orders on their books are traceable directly to defense.

CMP to Rescue—The industry foresees ultimate solution of their materials procurement headache in the fourth quarter, when the Controlled Materials Plan is expected to take hold, and an easing some time in the third quarter now that National Production Authority has assigned a DO priority. But for many companies, materials are still a serious problem and production is suffering because of it.

A large producer estimates that if he could obtain all the materials he needs he could ship 50 pct more machines in the next month. The critical items include castings, forgings, some types of bearings, alloy bars, hydraulic equipment, clutches, brass stampings, springs, motors, and electrical controls. Delivery promises on hydraulic equipment are 5 months, electrical controls up to 35 weeks, and motors from 10 to 12 weeks.

Slight Easing—Steel is not as

tight for the industry as it once was. In the past, builders often were forced to pay premium prices and some companies paid through the nose for foreign steel.

In the first 5 months of 1951, materials shortages cost one builder approximately 26,000 man-hr of production. Another producer questioned whether solution of his materials problem would help unless he could also find the manpower he lacks.

Change in Policy—The impression is growing here that Washington has made a quiet shift in policy on mobilization. The belief is that the plan for a quick buildup of the country's industrial and military might may have been discarded in favor of a more gradual strengthening extended over a period of perhaps 5 or 6 years.

This belief is bolstered by the attitude of top mobilization officials toward the machine tool industry. Industry representatives point to the struggle they had obtaining official recognition as being vital to defense and thus entitled to priorities for materials. If the intent was to expand production in as short a time as possible, they say, they would have been given priority status quickly and without contest.

The machine tool builders are hoping that this appraisal of the situation is correct, because for them it would eventually spell relief from pressure on the industry.

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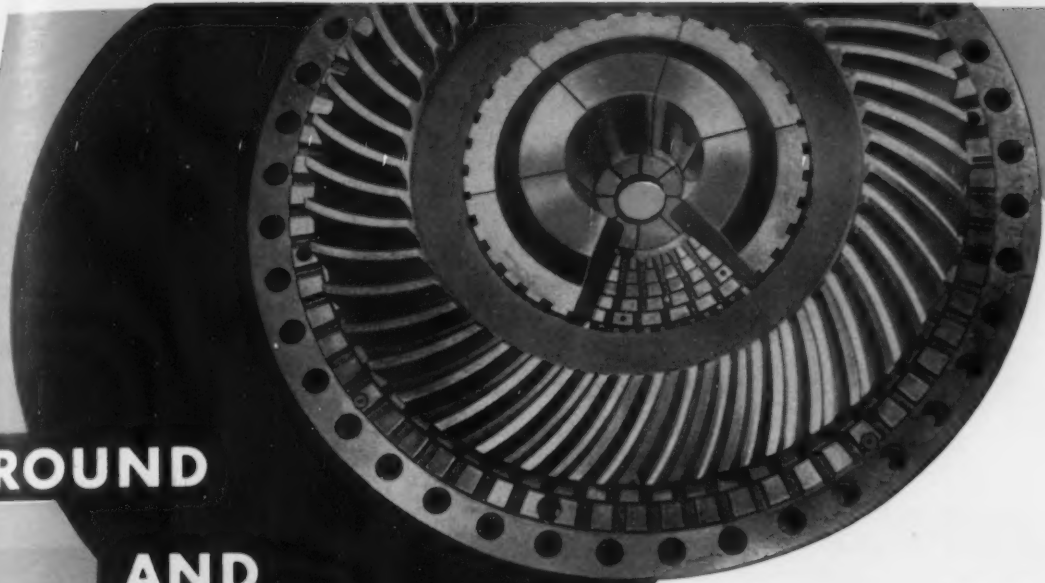
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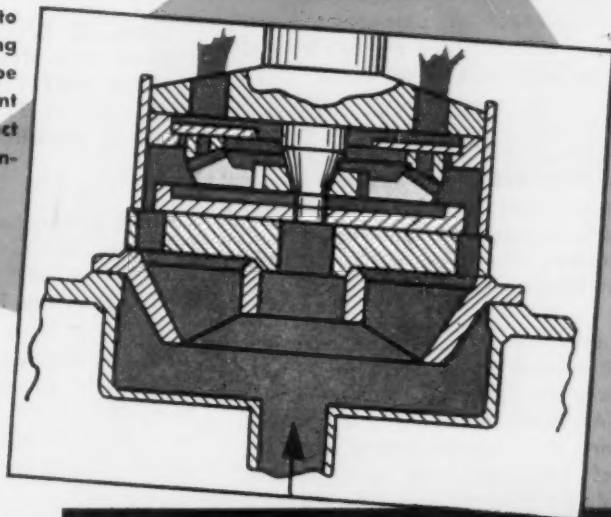
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- Safer loading
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IRON AGE

introduces

H. E. Baughman, made vice-president in charge of operations and **Duncan Baxter**, vice-president in charge of industrial relations of the Portsmouth Div. of **DETROIT STEEL CO.**, Detroit.

A. J. Couse, elected assistant to the vice-president and general sales manager of **EDGEWATER STEEL CO.**, Pittsburgh. **D. W. Odiorne** made district manager of Chicago and St. Louis territories, and **W. O. Fleming**, named metallurgical engineer.

William J. Wolf, made president of **FABRICATED STEEL, INC.**, Hamilton, Ohio. **Frank K. Vaughn**, becomes vice-president; **Freda Jennewein**, secretary-treasurer; and **Mrs. W. P. Griesmer**, **Walter A. Rentschler** and **Carl Jennewein**, directors.

Leonard J. Linde, appointed assistant general manager and chief engineer of the Boston Works of **ALLIS-CHALMERS MFG. CO.**, Milwaukee. **Henry P. Pinkham**, made assistant chief engineer; **John F. Chipman**, product engineer; **George W. O'Keefe**, manager of sales; and **Alfred E. Kilgour**, assistant manager of sales.

Archie M. Marsh, appointed manager of sales in St. Paul for **AMERICAN STEEL & WIRE CO.**, Cleveland, succeeding **D. R. Waterman** who retired.

Seth H. Stoner, promoted to general works manager of the New Departure Div., **GENERAL MOTORS CORP.**, Bristol, Conn. **Frederick J. Garbarino**, named chief engineer; **Alfred F. Herold**, general manufacturing manager; **John J. Curry**, assistant to general works manager on special assignments related to defense effort; and **George A. Smith**, manager of production engineering.

H. J. Kreher, appointed assistant manager of the railroad, pig iron and chemical division in charge of pig iron and coal chemical products for **INLAND STEEL CO.**, Chicago.

Arch J. Cochrane, appointed assistant manager of Chicago district operations for **YOUNGSTOWN SHEET & TUBE CO.**, Youngstown.

James E. Breth, appointed chief engineer and **Howell J. Broughton**, assistant chief engineer of the Coal Mines Div. of **TENNESSEE COAL, IRON & RAILROAD CO.**, Birmingham.

L. M. Evans, becomes head of the Rochester, N. Y. office of **WORTHINGTON PUMP & MACHINERY CORP.**, Harrison, N. J.

John A. Luttrell, elected Pittsburgh district manager of **LATROBE ELECTRIC STEEL CO.**, Latrobe, Pa., succeeding **George W. Frick**, made assistant sales manager.

Edward D. Williams, appointed to the Philadelphia district sales office of the **CHAIN BELT CO.**, Milwaukee. **Truman J. Hammel**, assigned to Kansas City office; **R. W. DeMott, Jr.**, New York office; **Kenneth Burch**, Cleveland office; and **George Robichaud**, Boston office.

C. E. Witt, elected Pittsburgh district sales manager of the Wright Hoist and Ford Chain Block Divs. of **AMERICAN CHAIN & CABLE CO., INC.**, Bridgeport, Conn.

Colg Coolidge, appointed director of the Chemical Dept. of **E. I. DUPONT DE NEMOURS & CO., INC.**, Wilmington, Del., succeeding **Elmer K. Bolton**, who will retire on June 30.



ROBERT F. GALVIN, named president and chief executive officer of **Ohio Steel Foundry Co.**, Lima, Ohio.



W. B. CALDWELL, elected president of **Calumet Steel and Franklin Steel Divs. of Borg-Warner Corp.**, Chicago.



C. F. MYERS, elected vice-president and sales manager of **Morse Twist Drill & Machine Co.**, New Bedford, Mass.

IRON AGE

salutes

Herbert F. Jahn



KEY man in American industry is the toolmaker. He turns the dreams of engineers and production men into the reality of things.

Such a man is Herbert F. Jahn, president of the National Tool & Die Manufacturers Assn., and head of the B. Jahn Co. of New Britain, Conn. Herb runs one of the largest tool and die shops in the East.

He's an NTDMA charter member. Herb and the association represent 450 contract tool and die shops. They're fighting for greater recognition of the important part tool and diemakers play in the defense program.

When Herb and his father set up shop 40 years ago, most toolmakers came from Europe. With an eye to the future the Jahns started training local workmen as toolmakers. Today his men still serve a 4-year apprenticeship before becoming expert craftsmen.

Progressive dies are a B. Jahn specialty. The shop has turned out much tooling for Garand clips, carbine magazines, guided missiles, and machine gun links.

Herb likes to take a job from the conception stage and follow it through to completion. That's the way he tackles tooling problems and that's how he's fighting NTDMA's battles.

This stocky, hard-working dynamo likes work. For him it's fun. He relaxes with golf (score 88 with a 16 handicap), and deep-lake fishing. He's a greyhound and horse racing fan.



GEORGE A. INGALLS, named a vice-president of American Machine & Foundry Co., New York.



MERLE A. MILLER, appointed director and member of executive committee of Joseph T. Ryerson & Son, Inc., Chicago.



HERBERT J. COOPER, promoted to general manager of Cooper Alloy Foundry Co., Hillside, N. J.



JOHN M. DOLAN, appointed to the board of directors of Hydraulic Press Mfg. Co., Mt. Gilead, Ohio.

IRON AGE *introduces*

Continued

Richard A. Kelting, made manager of the Newark, N. J. sales office of the FALK CORP., Milwaukee.

L. Keith Covelle, appointed aircraft representative at Wright Field for KAISER-FRAZER CORP., Willow Run, Mich.

John R. Hertzler, J. Keith Loudon and E. P. Vanderwicken, elected to the board of directors of YORK CORP., York, Pa.

W. B. Booth, appointed manager of the Pittsfield Ordnance Operation of the GENERAL ELECTRIC CO., Schenectady. C. H. Ridgley, made manager of Aeronautic and Ordnance Systems Divisions' Johnson City, N. Y. plant.

William M. Stoll, appointed mining engineer for KENNAMETAL INC., Latrobe, Pa.

John L. Wilson, elected a director of MACK TRUCKS, INC., New York.

Michael Egan, appointed sales manager of the Chuck Div. of SUPREME PRODUCTS, INC.

Clifford H. Simmons, elected a director of CRESCENT BUTTE MINING & MILLING CORP., Gunnison, Colo.

William F. Scanlan, joined the Houston district sales office of SWENSON EVAPORATOR CO., Harvey, Ill.

Allan P. Walker, becomes design engineer and Adam C. Pebrinkis, chemical engineer for the Engineering Dept. of HOOKER ELECTRO-CHEMICAL CO., Niagara Falls, N. Y.

Earl E. Bradway, named general manager of DeJUR-AMSCO CORP., New York.

Charles A. Bonn, appointed abrasive grain engineer for the NORTON CO., Worcester.

B. G. Nelsen, in charge of the Phoenix office of DUCOMMUN METALS & SUPPLY CO. W. A. Steinmetz will assist Mr. Nelsen in the new branch sales office.

Carl H. Horne, becomes general sales manager of the Refrigeration Div. of RHEEM MFG. CO., New York.

J. C. Cushing, appointed assistant to the president of A. C. LESLIE & CO., LTD., Montreal.

Harry A. Dennis, appointed assistant sales manager of GRAVER TANK & MFG. CO., INC., East Chicago, Ind.

Richard F. Baley, named sales engineer for the AMERICAN FIRE CLAY & PRODUCTS CO., Canfield, Ohio.

G. Gordon Hertslet, named to head the newly formed customer public relations and advertising departments of the GAYLORD CONTAINER CORP., St. Louis.

Richard E. Sweitzer, appointed sales promotion and advertising manager for TRION, INC., McKees Rocks, Pa.

OBITUARIES

Franklin W. Olin, 91, founder of the Olin enterprises which now make up Olin Industries Inc., East Alton, Ill.

John M. Hopwood, 67, chairman of the Hagan Corp., Pittsburgh.

Harold Q. Noack, 50, divisional vice-president, central division sales of Columbia Steel Co., San Francisco.

L. F. R. Bellows, 69, president of the Bellows Co. and the Bellows Electric Sign Corp., Akron, Ohio.

Vincent L. Daulton, 47, Philadelphia district sales manager of John A. Roebling's Sons Co., Trenton N. J.

George B. Stoess, 38, assistant sales manager of the Wire Rope Div. of John A. Roebling's Sons Co., Trenton, N. J.

Russell J. Dewees, 65, founder of the R. J. Dewees Co. of Dallas.

Herbert Bate, 59, sales manager of the Posey Iron Works of Lancaster, Pa.

Robert W. Liddell, 77, associated with Somers, Fidler & Todd Co., Pittsburgh, for 50 years.

*Patterns in
Pensions*

YOUR RETIREMENT PROGRAM

SHOULD BE GEARED TO YOUR COMPANY EARNINGS

IF your company EARNINGS ARE STEADY

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IF your company EARNINGS ARE ERRATIC

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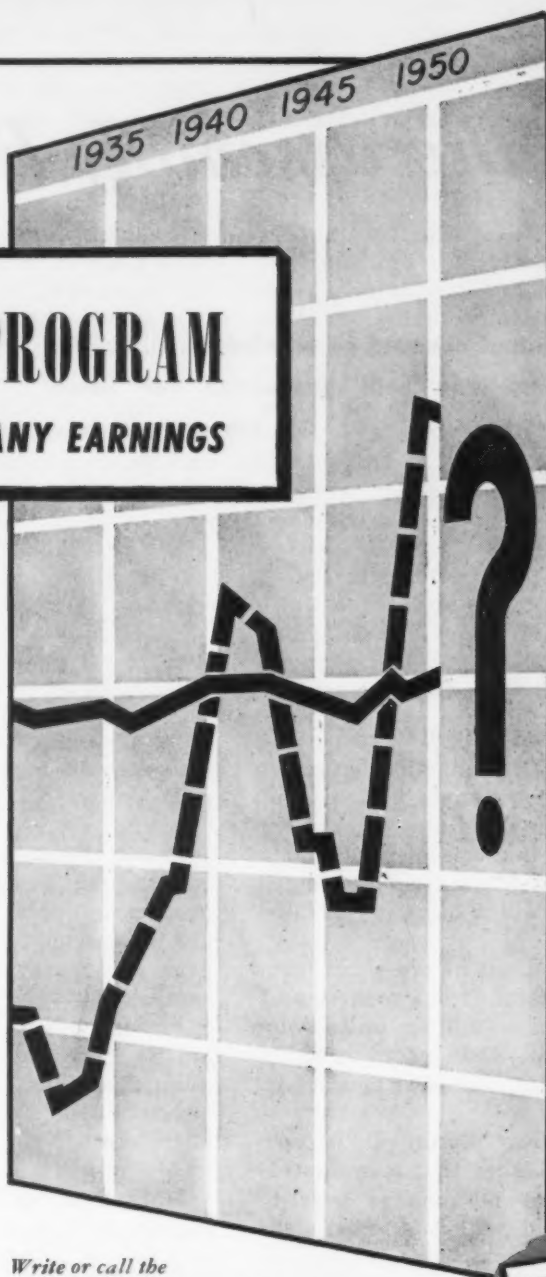
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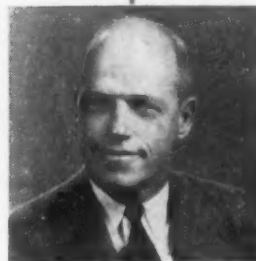
THE NATIONAL CITY BANK OF NEW YORK

ESTABLISHED 1812

on the assembly line

automotive
news and
opinions

Auto output changed to new basis . . . Limited materials may hold production far below permitted level . . . GM research on paint



by Walter G. Patton

One-Third Cut—How realistic is the 1,200,000 production figure for the third quarter set up by NPA? Some informed Detroit observers point out that based on available materials now in sight the figure could probably fall as low as 800,000 units.

This is a cut of one-third from the NPA total. It is a reduction of more than a million units compared with the record-breaking third quarter of a year ago.

Better Buy Boron—It is now well established that manufacturers who do not change over to boron steel will find themselves out in the cold after September. The use of boron steels by auto plants will step up rapidly during the next few months. (For full story see p. 107.)

Historic Base—While auto builders are still digesting M 68 (which limits car output during July-August-September to 1,200,000), the new order is believed to be more sound than the old base which was constantly adjusted to take into account production lost during the Chrysler strike and other factors.

Some adjustments will still be necessary. However, the present base is more logical and more understandable since it preserves the historic industry position of each car producer. Exceptions

have already been made to take into account a producer's break-even point.

Truck Production — NPA is working out a new plan for truck production control. The truck order is expected to follow the same general pattern as passenger car controls.

Present indications point to separate orders covering heavy, medium and light trucks. The new orders should be released in the near future.

More Optimistic Picture—Changing the base period from the first half of 1950 to the third quarter of 1950 puts a more optimistic face on the motor car picture. However, changing the base won't necessarily build more vehicles. The problem of obtaining materials is still paramount. Carbon bars and alloy bars are leading the growing list of short materials. Alloy bar set asides for September are 75 pct *plus* requirements for converters and warehouse (which may take an additional 8 pct). After converter and warehouse are added to a 55 pct carbon bar DO set aside, as much as 85 pct of the total steel could go for defense or defense-supporting industries in September, it is argued.

Remember the Breakdown—It should be remembered, however,

that these percentages are maximum and DO's have to be broken down by company, by mill and by product. The actual "take" is less than this but the total is tending more and more to reach these top limits. Despite mounting DO totals, the opinion is growing in Detroit that steel may be available in surprising quantities in the last quarter if tight inventory controls are in operation. Every day additional reports come in of defense projects for which steel has been ordered far in advance of actual production needs.

Switch to Lighter—While car producers could conceivably switch to lighter models among the present lines, ability to do this is limited. GM has been dividing its steel among GM divisions on a historic basis and undoubtedly will continue to do so as long as possible.

Maintaining its competitive position in each price class as well as fair treatment for all GM dealers will dictate such a course—for the present at least. A switch by Nash to the fast moving Rambler and by K-F to the Henry J is a more realistic possibility.

Output Mathematics—To compute his available materials, the car producer takes his NPA rating and multiplies by 1,200,000. This

assembly line

Continued

figure is then multiplied by the average requirement per car of copper, steel and aluminum. If a producer has substituted cast iron for aluminum, for example, he is expected to continue the substitution.

Continue Conversion—Car companies are limited to a maximum of 40 pct of the quarterly production in any one month. They are supposed to continue to use the same percentage of conversion steel. This latter requirement is impractical where conversion space, available last year, is no longer open.

Steel foundries are dropping out of conversion. More important, the bulk of conversion came from partial shutdowns of big mill blast furnaces and openhearthers that made rolling space temporarily available. The same space is no longer open in most cases.

Extensive Research—Seemingly simple research trails often stretch out for years. Even with the tremendous resources of General Motors behind it, it took 11 years of research to find out what causes "chalking" of the finish on your car.

Research started in the GM Laboratories. Exposure racks were established in Miami, Fla., to test the theories developed by GM researchers in the laboratory. GM chemists also made a series of exposures of auto finishes on a 10,000 ft mountain near Montezuma, Chile, at a Smithsonian Institute weather station.

Paint Cups Explode—The big step forward came quite dramatically when two sealed paint test cups being exposed at Miami, Fla., exploded, scattering pieces a distance of 10 to 12 ft. The explosion was probably the most important single piece of evidence in the long series of experiments, according to Ralph J. Wirshing, head of the General Chemistry Department of General Motors Research Laboratories.

GM chemists believe peroxide caused the explosion. "We knew from work done on an entirely unrelated problem that light acting on zinc oxide, in the presence of moisture, causes the formation of peroxide," Wirshing told ASTM. The test paint had contained a material similar to zinc oxide. To test this theory, GM chemists went back to work. While it is generally believed that hydrogen peroxide is an oxidizing agent and that oxidation causes auto finishes to become dull with age, GM chemists set about to prove that under certain conditions hydrogen peroxide can act as a reducing agent.

Auto Finish Theory—These "certain conditions" were set up in the laboratory. Both lacquer and enamel surfaces dulled the chalk quickly, both in the laboratory and outdoors. Chalk formed in a matter of minutes when moisture or a wetting agent was smeared on test panels.

Out of this research has come a new chemical theory about auto finishes. Reduction action—not oxidation—causes finishes to deteriorate.

Explaining the results of his work to the American Society for

Testing Materials, Wirshing pointed out that much work on paint remains to be done. He also indicated that the new theory of paint deterioration may apply to house paints and other types of protective and decorative coatings.

King Size Engine—At the 1951 Michigan State Fair, Buick will exhibit an animated engine about twice the size of a normal engine. By means of colors and lights, spectators can see how gasoline enters the combustion chamber, how the top of the piston compresses the air-gas mixture, how gas is ignited and how the exhaust is discharged.

Tour in Comfort—Oldsmobile is using a four-car train accommodating 35 passengers to take visitors around its manufacturing operations and assembly lines. Two trips are made daily. Loud speakers are located in the front seat of each nine-passenger car.

A guide, seated in the last seat of the trailer, describes the various operations. During a 90-minute tour, visitors see the Rocket engine, pressed metal and final assembly plants. More than 15,000 visitors toured Oldsmobile in '50.

THE BULL OF THE WOODS

By J. R. Williams

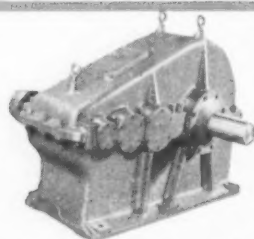


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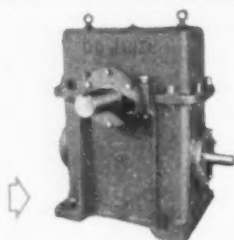
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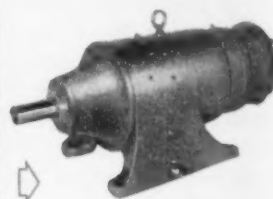
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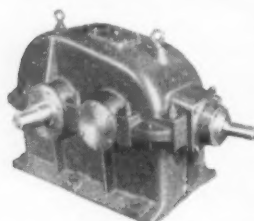
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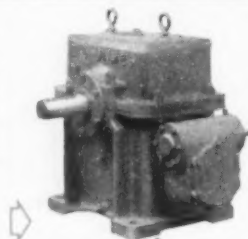
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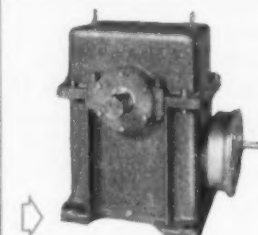
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Spiral Bevel Herringbone



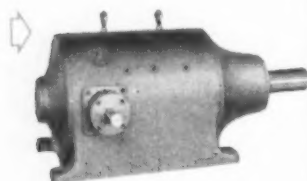
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west coast progress report

*digest of
far west
industrial
activity*

by R.T. Reinhardt



Seeking Contracts—More than 1000 small manufacturers of everything from tents to complicated cut gears visited Exposition Building in Oakland, Calif., last week to learn whether they might participate in the multi-million dollar contracts held by prime contractors with the Government.

Results were varied. There was ample evidence that enough mutually beneficial contracts had been made to warrant calling the effort a success.

Confused, Uncertain—Still, scores of would-be subcontractors left the clinic confused and uncertain. The more than 50 prime contractors were hard and specific about performance both as to time and tolerances.

Western manufacturers, even though their hearts and sinews were willing, often found themselves at a disadvantage because of their smallness.

Contractors such as Lockheed Aircraft Corp., Studebaker Corp. and Westinghouse Electric Corp., generally felt time and manpower spent at the clinic worth while.

Unrecognized Talents—It is readily discernible liaison between prime (taken loosely to mean "large") contractors and small producers needs improvement. It hardly seems necessary for two manufacturers from southern California to travel hundreds of miles

to learn whether they can be of service to one another.

There is little question the small manufacturer in the West has a lot to learn about mass production. But it is also obvious that with a little training and additional tools and equipment, many could meet Eastern competition. Most western manufacturers have the fundamental "know-how," but many must learn the angles of volume production.

Spot checks among the prime contractors at the clinic indicated a definite lack of screw machine and volume precision lathe open capacity.

Start Construction—Work on the melt plant of Seidelhuber Steel Rolling Mill began last week in Seattle with production of steel ingots from a 25-ton electric furnace promised for August.

Rolling of 20-in. strip at the rate of 50,000 tons per year is scheduled to begin December 1952. Contractor E. F. Shuck, Inc., is on a 24-hr basis to complete the scrap and melt buildings before August.

First Strip Mill—Three hundred men will be employed when the mill is in full operation. Officials have stated capacity of the mill may be doubled when materials and mill equipment are more readily available.

This is the first steel strip production for the Pacific Northwest.

Flash welding equipment will be installed to permit production of any width sheets in multiples of 20-in.

Seattle Needs Scrap—L. C. Knight, Bethlehem Pacific Coast Steel Corp., Seattle, Wash., hopes to uncover 100,000 tons of scrap in the current drive in industry. He estimates Seattle steelmakers are now short about 50,000 tons of normal inventories.

In addition to a drive among industries, Mr. Knight hopes to move some of the jalopies from wreckers' yards, although wreckers claim that at ceiling prices they will be lucky to break even.

Rheem on Display—Officials of Rheem Mfg. Co., at Richmond, Calif., told touring members of the San Francisco Stock Exchange last week Rheem was the largest single user of hot-rolled steel sheets in the West.

C. V. Coons, vice-president in charge of sales said the Richmond plant was using about 4000 tons in gages of sheet and plate to make 100,000 55 gal oil drums per month plus thousands of pails and water heater tanks.

Lithographed Drums—Of interest to the plant visitors was the newly completed Rheemcote line which produces lithographed oil drums in multiple colors.

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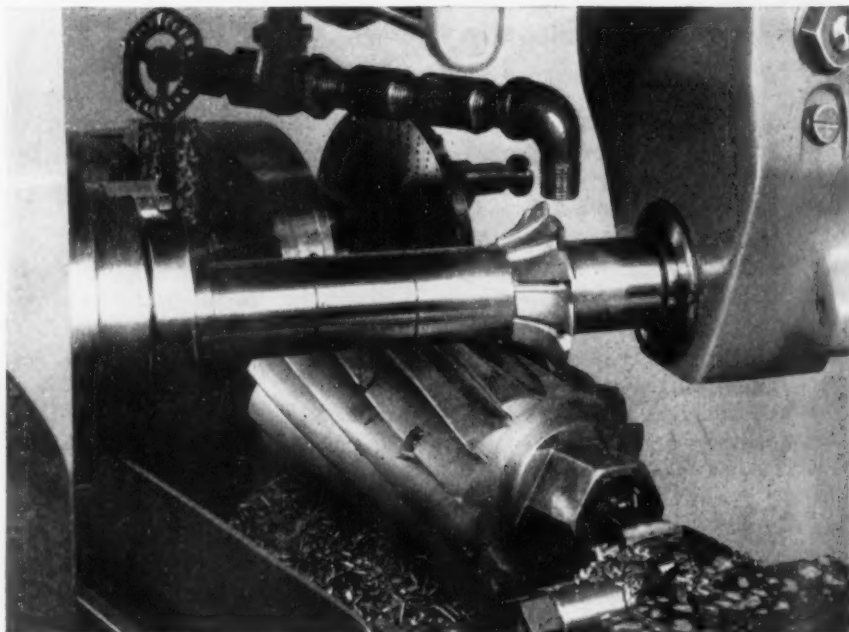
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the federal view

*this week in
washington*

by George H. Baker



Defense Spending—By this time next year, the nation will be spending more than twice as much on defense as it is now.

President Truman's Council of Economic Advisers, in making this prediction last week, estimated defense spending would gain by \$30 billion (annual rate) before mid-1952.

Pressure Will Mount—Therefore, the council argues, inflationary pressures will continue to mount unless the government maintains a vigorously active program to drain off excess purchasing power.

This line of thought was played up last week when President Truman carried his fight for a 2-year extension of controls to the people in a radio talk. He wants a "tight anti-inflation" law with "sharp teeth."

When to Decontrol?—As far as abolition of controls is concerned, the council's outlook is pessimistic. Defense Mobilizer Wilson maintains that when a lot of new production comes in next year, decontrol should begin. But this is knocked galley-west by the council, which says expansion of production should permit a "relaxation" of some controls in 2 years or so.

This means that since it has controls once more, the government is reluctant to release them. By "relaxation" it means that it will lift controls piece-meal. It means, too,

that industry and business face the prospect of a controlled-economy for an indefinite period.

Tax Rise Slowed—Senate is preparing to trim nearly \$1 billion from the new \$7.2 billion tax bill. Both figures are a long way from the \$10 billion in new revenue President Truman requested in January, but current aim is to whittle down the appropriations bills to match the smaller revenue bill.

Corporate incomes taxes slated to rise 5 percentage points under provisions of the bill as it stands now. The increase, which probably will become effective Sept. 1, would be retroactive to Jan. 1. Nearly all individual income taxpayers will be paying 12½ pct more than at present.

Consumers Must Wait—Production from expanding steel and aluminum capacity is not likely to benefit civilian consumer goods for at least another year.

Defense Mobilizer Wilson says it will take at least that long to get production up to the point where defense needs can be met and allow more of these metals to be allocated for consumer durables and other restricted production.

Wilson still sees defense mobilization plans coming along better than expected. But at the same time, he frankly admits restrictions are likely to be drawn still tighter and materials supply for civilian

supply limited still more. Extent will become clearer when all production is brought under CMP in the fourth quarter.

No Contract "Influence"—People who claim the Munitions Board's industry advisers influence the awarding of defense contracts just don't know what they're talking about, according to John D. Small, the board's chairman.

This answer ought to be obvious, Small told a House monopoly-investigating subcommittee last week, because the Munitions Board doesn't award contracts.

Small Business Benefits—The subcommittee, headed by Rep. Celler, D., N. Y., is looking into charges that industry task forces are flaunting government procurement regulations.

Munitions Board records show that small business received 67 pct of the defense contracts awarded by negotiation from July 1, 1950 to Mar. 31 of 1951. This is 27 pct of the dollar value of defense work, compared with 24.5 pct for the preceding 12 months.

War Probes Are "Naturals"—Congressmen of both parties are well aware defense-investigating committees are "naturals." They point out that nobody outside Missouri ever heard of Harry S. Truman until he rode to fame with his World War II investigating group.



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- 3 Making *better steel, faster.*

STRESS CORROSION



by J. T. Clenny
Switchgear Divisions
General Electric Co.
Philadelphia

of cast bronzes evaluated

Tests of 10 cast copper alloys under stress in ammonia atmosphere indicate that aluminum bronzes (10 pct Al) offer the best resistance. Four different methods of evaluating the test results were used, including the determination of stress corrosion endurance limits and the percentages of loss of tensile strength due separately to stress and corrosion.

Simple and electrolytic corrosion can often be reduced by surface treatments such as plating or painting. These treatments will also reduce the possibility of stress corrosion, but other methods have often proved to be more effective. A stress-relief anneal at a temperature suitable for the alloy will reduce casting strains as well as quenching and welding stresses.

Strains induced by poor casting design, oxide or other inclusions, phase segregation, gas porosity, or large volume shrinkage can be overcome only by a critical review of the casting design for the best contour characteristics. This should be followed by a careful appraisal of the casting patterns, so that risers and chills can be located to derive the utmost benefit from uni-directional solidification.

Try reviewing materials, processes

To reduce the possibility of field failures, a review of the materials used and the processes involved is also recommended. For example, another material may have a higher corrosion level and therefore not be attacked by the corrosive medium present. The same metal can sometimes be given greater strength with less internal stress or a more dense structure by using forged or wrought structure rather than a casting. Also, surface treatment may improve resistance to the corrosive medium under certain operating conditions.

The effects of stress and corrosion upon castings has not been covered in any previous work. Since most castings are designed more gen-

erously than their connecting links in any structure, few service troubles have been encountered. Attention was centered on the high-strength, non-magnetic copper alloys in this investigation. Among other findings, a method of detecting the symptoms of stress corrosion in an accelerated corrosion test was developed.

Stress corrosion has been experienced several times in high-tensile manganese bronze. Some three and a half years ago, this led to the use of aluminum bronze, which was believed to have less susceptibility to the combined effects of stress and a corrosive media.

An example of such a change of materials is afforded by switchgear. In such equipment, electrical connectors similar to an eyebolt in shape are used, Fig. 1. These connectors must be non-

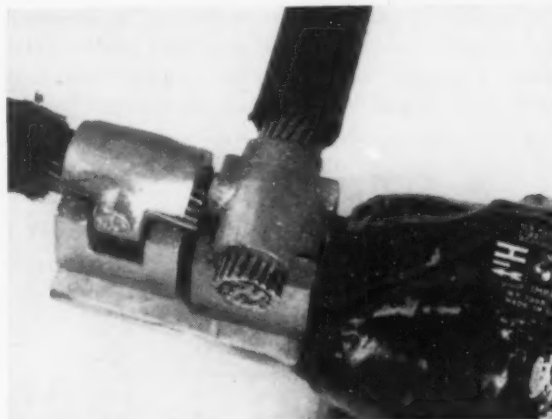


FIG. 1—An example of switchgear using high-tensile cast bronze alloys.

magnetic and yet have sufficient strength to support heavy copper cables when bolted tightly to switchgear framework. Normally, the strength requirements would indicate manufacturing by forging. However, since production needs were low, this was not possible. In physical strength, the manganese bronzes were ideal, and they are probably the easiest high-strength bronzes to cast, being characterized by high fluidity.

However, the manganese bronzes are plagued by oxide inclusions and a high shrinkage rate. This is conducive to an open, dendritic structure often termed "coring" and/or "microporosity," depending upon the condition of the segregation or the size of the cavities. To a large extent, these poor qualities are the cause of internal stresses. Other causes are casting strains and quenching and welding stresses. Such strains and stresses can be relieved by a low temperature anneal. But the other causes, along with gas porosity, can be removed only by remelting the casting.

Aluminum bronzes not easy to cast

The aluminum bronzes have never been known for easy castability. Yet it was considered that the aluminum content, approximately 10 pct, would more than offset the high zinc content of the manganese bronzes in reducing corrosion. Actually, these manganese bronzes have been misnamed, for their zinc content of 16 to 24 pct would normally place them in the class of brasses.

With these facts in mind, a test program was undertaken which included most of the high tensile bronzes. The silicon bronzes which, in most cases, are extremely difficult to machine, were excluded.

A search of existing literature failed to disclose any data on aluminum bronze casting alloys, although references to these alloys in the wrought form indicated that they are one of the best available materials. The information contained in these references permitted production changes to be made pending the collection of data. Thus, needless delays were avoided.

The investigation consisted of an accelerated corrosion test with the test specimen under static load. This test was conducted on machined, cast test bars. These were not stress-relieved by the

G-E Company and, having been obtained from several different vendors, were the results of different methods of casting. Actually, this proved to be an ideal check upon these vendors' foundry practice for the particular alloy involved.

The program included stress-corrosion tests on the cast alloys whose chemical compositions are shown in Table I. Table II is a compilation of the data obtained during the tests. The stresses imposed on the alloy samples and the duration of exposure to corrosive conditions are indicated. In addition, a correlation of hardness, grain size and fracture angle is shown.

There are numerous ways to express the results of stress-corrosion tests. Several methods have been included to permit comparison. Particular emphasis has been placed upon the interpretation of such results since any accelerated test always presents a hazard when attempting to use test results to evaluate given service conditions. This makes it important to keep the severity of the test conditions in mind. To generate an ammonia atmosphere, 15N ammonium hydroxide solution was used. While normal atmospheres may not show as high an ammonia content, the process could be an excellent example of accelerated normal conditions. Since moisture in the air can be absorbed by a metallic surface, any ammonia or other gases could dissolve in this outer layer. These absorbed gases can cause a shift in the pH of the surface and, in turn, will cause a change in the rate of corrosion.

Generous safety factor provided

In considering the following data, it should be remembered that in most designs a generous safety factor is provided. This greatly minimizes the threat of stress corrosion failures.

The endurance method of expressing results of tests of this type involved the determination of endurance limits and setting up values for the ratio of endurance limit to yield strength for each material. Through the use of interpolated values from established stress corrosion curves, Figs. 2 through 5, the alloys tested have been arranged according to their relative merit in Table III.

Since the values termed "stress-corrosion limit" in this table are interpolated, they are not recommended for design purposes. They are,

TABLE I

CHEMISTRY OF ALLOYS TESTED

Alloy	Designation	Cu	Co	Zn	Al	Mn	Ni	Sn	Be	Fe
Aluminum Bronze	A	87.92			10.54					1.59
Aluminum Bronze	B	88.46			10.2					1.42
Aluminum Bronze	C	88.14			9.16					2.70
Manganese Bronze	D	62.70		20.9	6.44	4.35				6.12
Manganese Bronze	E	69.08		19.42	5.62	3.34				2.54
Beryllium Copper	F	97.84	1.45						0.71	
Beryllium Copper	G	96.92				1.56			1.37	0.15
Nickel-Tin Bronze	H	88.28		1.93			4.93	4.86		
Copper	I	99.94								

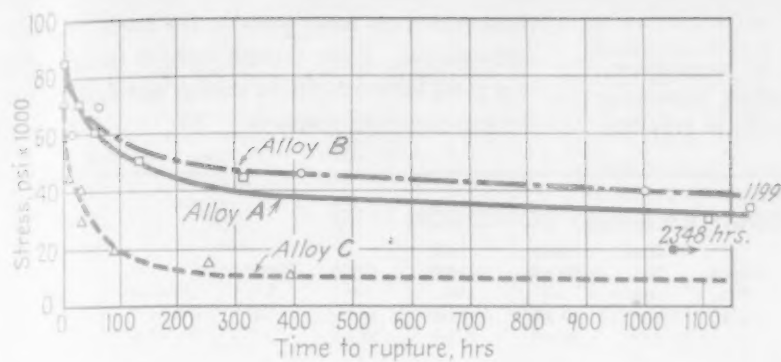


FIG. 2—Stress-rupture plot of corrosion in aluminum bronze alloys.

FIG. 3—Stress-corrosion plot of corrosion in manganese bronze alloys.

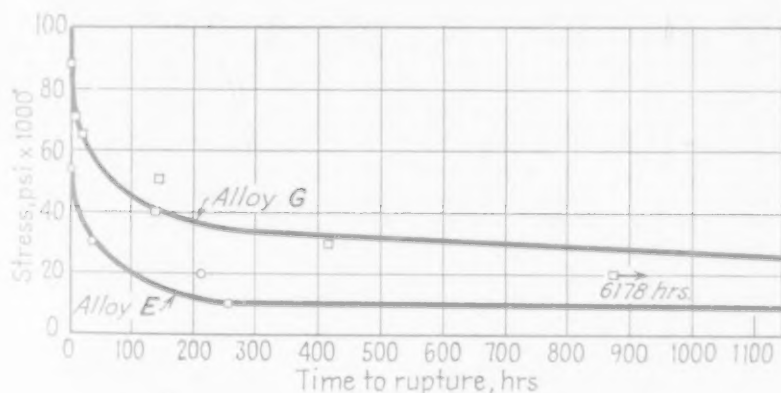
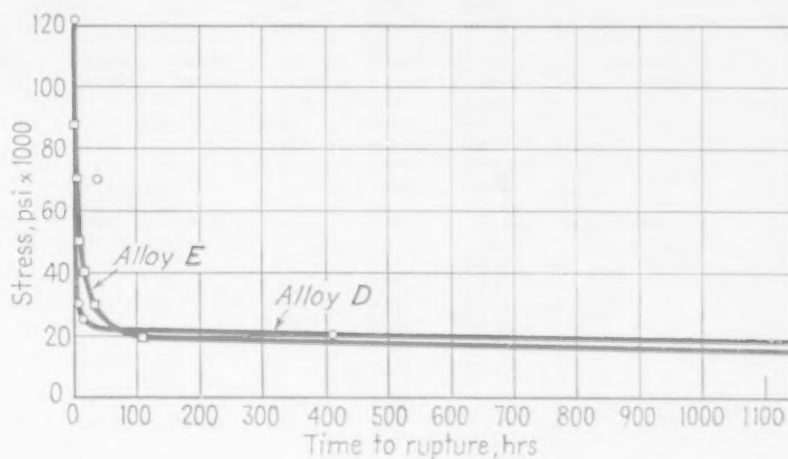
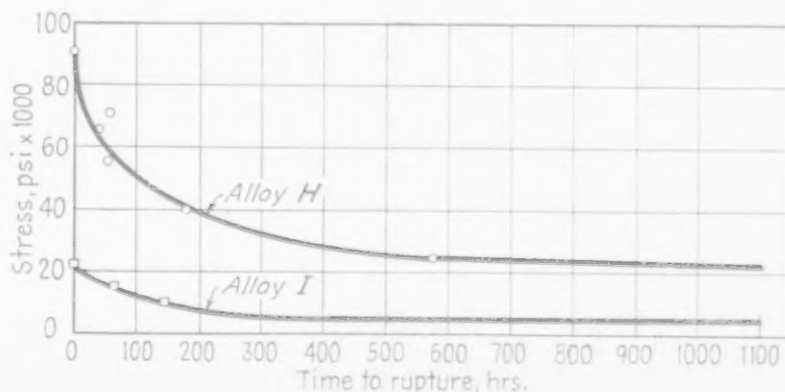


FIG. 4—Stress-rupture plot of corrosion in beryllium copper alloys.

FIG. 5—Stress-rupture plot of corrosion in copper and nickel-tin bronze.



Stress corrosion (continued)

however, valuable for purposes of comparison. The rating of the various cast alloys according to their original yield strengths tends to separate

those materials most suitable for use in ammonia atmospheres. Even though normal designing is to a yield strength, these values, again, are given for comparative purposes.

TABLE II

RESULTS OF STRESS CORROSION TESTS

Material	Bar	Stress, psi	Hours in NH ₃	Grain Size, mm	Tensile Strength, psi	Yield Strength, psi	Elastic Limit	Elong. in 2 in.	Remarks
Aluminum Bronze A	1.	0	314.5	5.26	82,800	51,000	33,000	12	Hardness R _E 103-107
	2.	0	0	6.88	84,900	51,100	33,500	12	
	3.	70,000	26.85*	1.88					
	4.	60,400	63.71*	4.9					Angle of fracture 60° in all cases
	5.	50,000	133.95*	2.6					
	6.	45,000	314.6*	2.63					
	7.	33,000	1198.7*	5.63					
	8.	30,000	1104.9*	2.63					
Aluminum Bronze B	1.	0	163.9	0.75	88,100	43,000	19,000	14	Hardness, R _E 103-108
	2.	0	0	3.4	81,300	43,000	19,000	14	
	3.	70,000	69.1*	3.38					
	4.	60,000	14.6*	4.88					Angle of fracture 45° in all cases
	5.	45,000	414.4*	6.0					
	6.	40,000	1007.5*	4.0					
	7.	20,000	2348.0	3.5					
Aluminum Bronze C	1.	0	92.0	0.90	67,920	24,000	16,000	20	Hardness, R _E 83-104
	2.	0	0	0.75	71,100	24,300	16,000	20	
	3.	45,000	9.6*	0.90					
	4.	40,000	29.8*	1.13					Angle of fracture 45° in all cases
	5.	30,000	32.6*	1.88					
	6.	20,000	90.5*	0.23					
	7.	17,500	254.7*	3.0					
	8.	15,000	393.4*	1.13					
Nickel-Tin Bronze H	1.	0	181.2	0.90	81,900	74,000	21,500	21	Hardness, R _E 83-111
	2.	0	0	1.13	90,100	74,500	21,700	21	
	3.	70,000	55.9*	1.13					
	4.	65,000	35.2*	1.14					Angle of fracture 45° in all cases
	5.	55,000	55.9*	1.5					
	6.	40,000	181.3*	0.23					
	7.	25,000	575.9*	0.75					
Manganese Bronze E	1.	0	300.9	1.5	81,100	50,000	22,000	14	Rockwell R _E 101-104
	2.	0	0	1.88	88,000	50,000	22,000	14	
	3.	70,000	3.1*	1.5					
	4.	60,000	2.3*	1.5					Angle of fracture 20° in all cases
	5.	50,000	6.9*	1.88					
	6.	40,000	14.7*	1.13					
	7.	30,000	33.6*	1.5					
	8.	20,000	105.3*	0.75					
Manganese Bronze D	1.	0	163.9	0.05	105,000	80,000	63,000	16	Rockwell R _E 107-112
	2.	0	0	2.3	121,000	80,000	64,000	16	
	3.	70,000	66.1*	2.3					
	4.	60,000	1.3*	0.38					Angle of fracture 10° in all cases
	5.	50,000	7.7*	0.45					
	6.	30,000	5.0*	0.08					
	7.	25,000	12.2*	0.38					
	8.	20,000	408.0	0.4					
Beryllium Copper F	1.	0	163.9	3.38	54,900	26,000	17,000	25	Rockwell R _E 82-90
	2.	0	0	1.13	53,800	26,000	17,000	25	
	3.	50,000	177.8**	2.25					
	4.	45,000	228.4**	3.4					Angle of fracture 10° in all cases
	5.	30,000	36.9*	1.13					
	6.	20,000	210.8*	3.4					
	7.	10,000	267.5*	2.63					
Beryllium Copper G	1.	0	622.2	0.60	81,600	72,000	58,000	14	Rockwell R _E 98-110
	2.	0	0	0.38	87,800	72,200	58,500	14	
	3.	70,000	6.8*	0.75					
	4.	64,000	16.6*	0.38					Angle of fracture 5° in all cases
	5.	50,000	144.1*	1.14					
	6.	40,000	138.8*	1.88					
	7.	30,000	416.6*	0.9					
	8.	20,000	6177.6*	.....				
Copper I	1.	0	300.0	4.88	21,100	8,000	5,300	30	Rockwell R _E 25-50
	2.	0	0	4.9	21,400	8,000	5,300	30	
	3.	15,000	62.5*	3.0					Angle of fracture 15° in all cases
	4.	10,000	140.9*	5.63					

* Denotes that bar broke in test.

** Vapor lock in testing equipment.

NOTE: Visual examination was made of all fractured bars to determine uniformity.

TABLE III
STRESS CORROSION LIMITS COMPARED

Alloy	Endurance or Stress-corrosion Limit	Ratio to Yield Strength Value	Rating
B	29,400 psi	.684	1
A	28,000 psi	.550	2
H	21,700 psi	.291	6
G	20,000 psi	.277	6
D	19,000 psi	.225	9
E	14,000 psi	.290	7
F	9,000 psi	.346	4
C	8,000 psi	.330	5
I	4,000 psi	.550	3

The values shown in Table IV relate test results to tensile properties. These values can be charted to provide a graphic method of showing loss due to corrosion and that accelerated by stress. These are shown in Table IV as percentage losses.

Still another method of evaluating stress corrosion effects has been proposed in the ASM Metals Handbook, 1948, p. 227. As graphically presented in Fig. 6, bar A represents the breaking load of one of the three identical test specimens unexposed and unstressed. Bar B represents the breaking point of an exposed but unstressed test sample, while bar C stands for one that has been subjected to both corrosion and stress. During a test in which the exposed and stressed specimen does not break, the closer the breaking load of B is to A the greater has been the acceleration of corrosion by stress. The closer the breaking load of B is to C, the less acceleration of corrosion by stress has occurred.

When specimen C does break and the breaking load of B is nearer to A than to C, there is a greater tendency toward stress-corrosion cracking. Should the breaking load of B be closer to the load on C during exposure, the less the tendency toward stress-corrosion cracking.

Taking a point-slope value from Fig. 6,

$$\frac{Y - Y^1}{X - X^1} = M$$

another method of evaluating stress-corrosion becomes available. In Table V, values obtained by the use of this formula have been used to indicate an order of preference among the cast copper alloys tested.

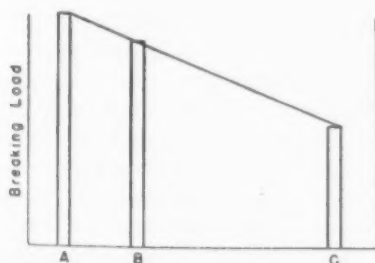


FIG. 6—A graphic method of evaluating stress corrosion. Based on Figs. 1 and 2, ASM Metals Handbook, 1948, p. 227.

All of the methods of evaluation show that the heat-treatable aluminum bronzes (aluminum content 10 pct) are the least subject to corrosion and to the acceleration of corrosion by stress in ammonia atmospheres. Aluminum bronze and cast copper show the smallest effect of ammonia corrosion, although all are subject to stress corrosion.

TABLE IV
STRESS CORROSION EFFECTS ON
TENSILE STRENGTH

Alloy	Stress on Bar	Hours in NH ₃	Breaking Strength	Loss Due to Corrosion	Loss Accelerated by Stress	Pct of Initial
A	0	0	84,900	0	.....	.....
	0	314.5	82,800	2,100	.....	2.47
	48,000	314.6	45,000	39,900	37,800	44.52
	46,000*	300. *	46,000	.....	.....	45.82
B	0	0	81,300	.....	.....	.....
	0	163.9	88,100	+6,800	.....	.....
	48,000*	163.9*	48,000	33,300	40,100	45.40
	39,500*	300. *	39,500	.....	.....	55.17
C	0	0	71,100	.....	.....	.....
	0	92	67,920	3,180	.....	4.44
	20,000	90.5	20,000	51,000	47,820	67.27
	9,800*	300. *	9,800	.....	.....	86.22
H	0	0	90,100	.....	.....	.....
	0	161.2	81,900	8,200	.....	9.10
	40,000	161.3	40,000	50,100	41,900	46.50
	32,500*	300. *	32,500	.....	.....	63.93
E	0	0	88,000	.....	.....	.....
	0	300.9	81,100	6,900	.....	7.84
	17,000*	300.9*	17,000	71,000	64,100	72.95
	17,000*	300. *	17,000	.....	.....	80.91
D	0	0	121,000	.....	.....	.....
	0	163.9	105,000	16,000	.....	13.22
	20,400*	163.9	20,400	100,600	84,600	70.00
	21,000*	300. *	21,000	.....	.....	82.65
F	0	0	53,800	.....	.....	.....
	0	163.9	84,900	+1,100	.....	.....
	19,000	163.9*	19,000	34,800	35,900	65.40
	15,000*	300. *	15,000	.....	.....	72.66
G	0	0	87,800	.....	.....	.....
	0	622.2	81,800	6,000	.....	6.83
	27,000*	622.2*	27,000	60,800	54,800	62.41
	34,000*	300. *	34,000	.....	.....	61.28
I	0	0	21,400	.....	.....	.....
	0	300.	21,100	300	.....	1.40
	4,000	300. *	4,000	17,400	17,100	80
	4,000	300. *	4,000	.....	.....	81.31

* Indicates that value was taken from curves.

TABLE V
COMPARISON OF POINT-SLOPE VALUES

Alloy	M
B	0.225
I	0.225
F	0.250
A	0.300
C	0.350
H	0.375
G	0.400
E	0.500
D	0.700

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British wire gear maker adds POWDER SHOP



by John Rigby

Director

John Rigby Sons Ltd.

Low Moor, England

Like their American counterparts, British industrial organizations must also maintain a watch on new production methods and potential sources of competition. It was within the last decade that our attention was drawn to increasing use of powdered metals for structural parts similar to many we have long been producing from drawn wire. These parts include gears, pinions and other short, symmetrically designed parts under 1 in. diam. They can often be made of metal powder at a lower cost than from shaped wire rod.

It was the broad selection of applications already won by powdered metal fabricators in the United States that first made us aware of the promising nature of this production method. It was decided to investigate the possibilities of constructing and equipping a metal powder fabricating shop. As a guide, there was plentiful research, published information and actual experience to draw upon.

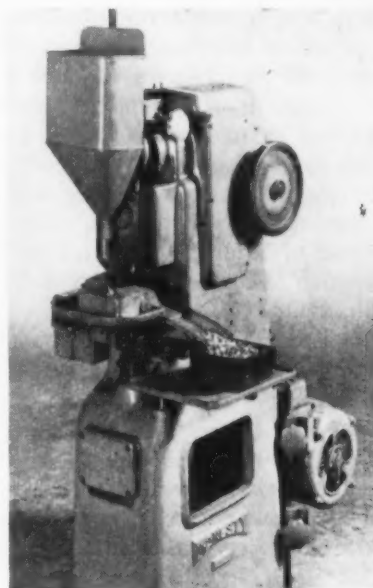
This data was mainly American, but not as much progress has been made in bulk production of structural parts as in U. S. There are several British firms, some with American connections, well established in the production of self-lubricating bearings and permanent magnets.

In comparison, it was found that in America, powder metallurgy had even invaded such conservative fields as calculating machine and clock manufacturing. One clock maker had installed his own powdered metal parts plant.

To adequately assess the fabricating of metal powder parts and so that a comparison can be made between powders and drawn wire as raw material for small structural parts, a review of current drawing and pressing-and-sintering practice at Rigby's follows.

Hot-rolled rod (in the case of brass, extruded) in coils weighing several hundred pounds are first pickled or descaled. After being pointed, they are drawn through hot-pressed tungsten carbide dies of our own manufacture. The degree of reduction is determined by the cross-sectional area best suited to the material being processed. As many drawing passes as required

Powder metallurgy has taken gear and pinion business away from shaped wire in America. One British wire gear maker has followed suit by installing a powder fabricating shop. On small, complicated parts, powdered metal has cut costs 50 pct.

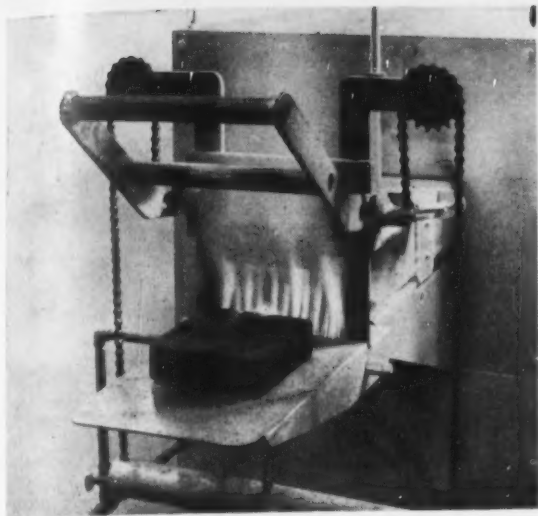


TYPICAL British press for pressing powdered metal parts.

are performed to bring the wire up to the final finishing pass. Heat treatment is used for normalizing or annealing according to generally accepted practice.

Still in coil form, the wire is given its final pass on rack benches, which also serve to straighten the material.

The methods and equipment are much like those in the United States and can produce large quantities of shaped wire at low cost. Finish and accuracy are equal to the precision hobber. While a plain hexagon free-cutting wire can be sold at only 10 to 15 pct above rod price, the more complicated shapes increase this differential as much as 200 pct because of the



SINTERING FURNACE used in new powdered metal parts plant of John Rigby Sons, Ltd.

greater number of drawing passes and annealing.

It is evident that the proportion of direct labor charges in the final cost of the finished article is very high in these complicated shapes. Therefore, the manufacturer of shaped wire has in his own control the bulk of his production costs.

This is rather the reverse of the situation in fabricating structural parts of metal powder. After only three or four operations, the parts are finished. The direct labor charges are lower, consequently there is less control of the finished price. The fabricator is very much in the hands of the powdered metal supplier.

Bulk of work in iron powder so far

This is true of powdered metal fabricators in general, the best of whose plants the Rigby installation was modeled after. The bulk of the work so far done has been in iron powder, either produced in England or imported from Sweden. The presses manufactured in America have been found to be the most suitable and they provide a high rate of production. Undoubtedly, this superiority of American equipment is largely due to the greater interest in press design in the United States, caused by greater demand.

The methods of production are conventional starting by adding lubricant to the powder, mixing it in a tumbler, and filling the hopper and pressing in hot-pressed tungsten carbide dies. Pressed parts are sintered in furnaces charged with disassociated ammonia, carried in either nickel-chromium alloy trays or carbon boats. They are then tumbled, sized and oil-impregnated if necessary.

In the case of this process, too, it closely resembles American powder metallurgy practice.

In analyzing the results of this entry into powder metallurgy, it was found that while both methods of producing small structural parts eliminated machining operations, the pressing-

and-sintering technique did so more than shaped wire. Both cut down material waste—again, powder more than wire. Where parts to be made are short and complicated enough to require several drawing passes and heat treatments, the powdered metal part is cheaper. Claims of savings up to 50 pct in some cases would seem to be justified. Unless there is considerable reduction in the cost of metal powders, rectangles, hexagons, squares and other such simple contours are likely to continue to be lower in cost when drawn or extruded.



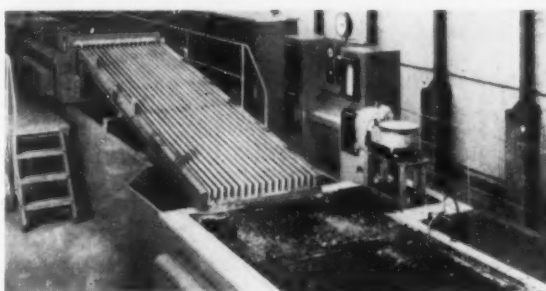
HOT-PRESSED tungsten carbide die made in the Rigby plant for wire drawing. Similar dies are used for pressing of powdered metal gears and pinions.

Long runs are, of course, equally advantageous in both processes. Other advantages and disadvantages exist in both processes. The porosity of the metal powder is welcome sometimes—but not always. This is particularly true where electroplating is involved. A good cheap stainless powder would be of considerable help here. Getting platers in England to accommodate their methods to powdered metal parts has been a special problem.

While the low mechanical strength of most commercially manufactured powders is sometimes a handicap, a broad field of applications exists where this factor is not important. Both the drawn wire and powdered metal processes are limited where thin webs or fins are required in a design.

It would seem evident that powder metallurgy is going to encroach more and more into the structural part market still largely supplied by the cold drawn product.

EQUIPMENT USED for the direct resistance heat treatment of shaped wire.



Instruments unsnarl metal mixups



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Tedious, time-consuming spot tests, chemical analyses and spark tests can be virtually eliminated through use of magnetic analysis and triboelectric test instruments. Such sorting instruments may also be employed for quality control and research studies.

The problem of mixed steel and other metals is one which is either full blown or just around the corner in almost every metalworking plant in the country. Its frequency of recurrence is directly related to the size of the operation.

Standard practice in most plants is to mark the product with heat numbers, grade markings or other identifying codes. Metals producers generally stamp or bundle-and-tag the product, warehouses resort to painted ends or crayon markings, as well as tags, and fabricators store their raw stock in bins that are presumably identified as to the grade or type of material which they contain. In spite of good routine control, however, it does happen that raw material loses its grade identity through normal handling and manufacturing operations.

Aside from chemical check analysis, the most widely used method for the identification of mixed steel is spark testing. Experienced operators are able to determine the quantity of carbon to the order of 0.05 pct with certainty; nickel, chromium, molybdenum, tungsten, silicon and even sulfur approximation is more qualitative than quantitative.

However, the spark test cannot be applied to the austenitic stainless steels and nonferrous engineering alloys. Long periods of training and experience are required for spark testing, and errors in judgment can result from lighting conditions or fatigue. The spark test is extremely rapid, relatively nondestructive to raw stock and does not react to the physical size, shape or metallurgical constitution of the steel.

Former methods are limited

Where the surface hardness of a given lot of mixed analyses is sufficiently different, the portable hardness tester may be used to good advantage. It has the advantage of speed and simplicity, and can often reduce the number of pieces which must be sorted by other means.

Chemical spot testing is used effectively and

with a great deal more credence in some plants than in others. Like spark testing, the success and speed of the spot test is largely dependent upon the personal ability and experience of the operator, the purity of the solutions used and a time-temperature function. Any colorimetric or photometric means for evaluation of the color produced, under well controlled reaction conditions, increases the analytical value of the test to a remarkable degree.

Portable spectrum analysis equipment for field use is available in the form of small, pre-calibrated spectrometers. The grating types of short focal length are not generally satisfactory for ferrous work because of their narrow dispersion and the crowded condition of the steel spectrum. However, their application to the nonferrous field is quite feasible.

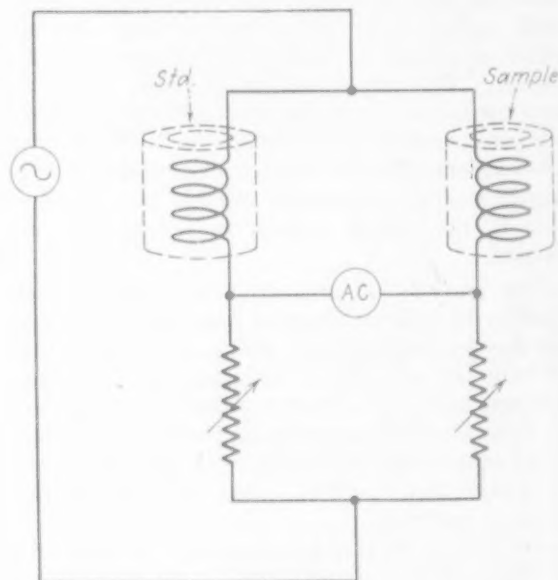


FIG. 1—Inductance of bridge circuit which forms the basis for magnetic analysis. This direct comparison setup has many useful applications, but has some mechanical and electrical limitations.

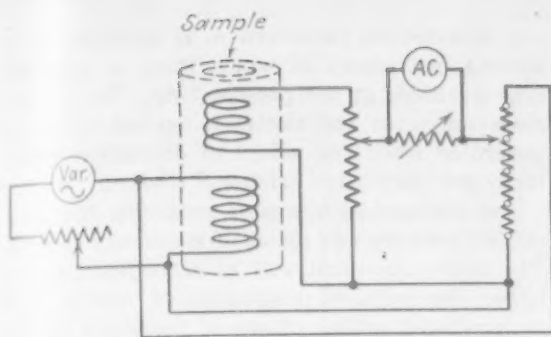


FIG. 2—This basic circuit idea used in most magnetic analysis sorting equipment is a superior embodiment of the inductance bridge theory.

The spark, spot and spectrographic tests show the effect of chemical variations while the effect of constitution is ignored inherently. The hardness test is principally indicative of the effect of metallurgical constitution; all ferrous alloys, as a class, and all nonferrous alloys, as a class, show only small differences in hardness in the as-cast state throughout a wide range of chemical variation.

Probably the first method for the determination of the alternating current magnetic properties of various alloys was the inductance of bridge circuit. This circuit, shown by Fig. 1, consists of two coreless coils of uniform construction and, in practice, several variable resistors and capacitors connected in such an arrangement that an alternating exciting current supplied to the bridge, as shown, divides itself equally between the two parallel "spans" of the bridge. An ac meter circuit tapped in at any two electrically conjugate points of the spans will read zero current flow and the bridge is said to be balanced.

Permeability has greatest effect

If the alternating frequency of the exciting current supplied to the bridge is within the range of useful frequencies for the magnetic analysis of ferromagnetic materials, that is, between 15 cycles per second and about 10,000 cycles per second, an iron or steel rod (the standard) placed into one of the two coils will unbalance the bridge and the measuring circuit meter will indicate some reading greater than zero. This happens because of composite effect of several magnetic properties of the rod all acting on the electromagnetic field of the coil simultaneously.

Permeability is the single property having the most pronounced effect in magnetic analysis. The term relates to the amount of magnetic energy that a material will absorb from a source of supply under fully specified conditions.

Although the permeability or permeance of an alloy is an absolute value, a practical sorting instrument defines it in terms that are relative to the chemistry and the constitution of the alloy, the physical size and shape of the piece and also, to a limited degree, the position in the search

coil with respect to its magnetic axis. Other measurable properties are retentivity, coercivity, hysteresis and eddy currents.

These properties never act individually; one is never in evidence without all the others. The highly complex chemistry of most alloys makes it virtually impossible to predict, for example, just what effect the presence of manganese may have on the coercivity component of the composite magnetic curve or instrument reading. Adding manganese displaces all other elements proportionally and at the same time changes the fundamental magnetic characteristics of the alloy. Carbon in steel has a very pronounced effect on permeability and retentivity; chromium on coercivity; high silicon on the reduction of retentivity and nickel on the magnitude of eddy currents and core loss.

Where the standard stuck into one coil of an inductance bridge caused unbalance of the bridge, the symmetry of the bridge is restored by placing a piece of identical mass, composition and constitution (the sample) into the companion coil of the bridge; this makes the bridge indicating meter read zero potential drop between conjugate points, indicating that the sample is identical to the standard. If the standard is representative of a wanted piece, other pieces of wanted analysis can be rapidly selected from a mixup.

Test piece size affects reading

A superior embodiment of the inductance bridge theory is shown by the circuit in Fig. 2. This general scheme, with modifications and elaborations, is the basic circuit idea of most magnetic analysis sorting instruments. A fundamental difference exists between the circuits of Figs. 1 and 2.

In both versions, the test pieces absorb magnetic energy from the coils. In the circuit of Fig. 1, however, some of the stored energy of the test piece is returned to the coil which provided it. This happens after a delay, and the net result is that the stored energy is returned late out of phase to the coil, causing the coil impedance to increase.

In the circuit of Fig. 2, the test piece behaves very much like the core of a transformer and transfers its energy to a secondary coil in which a potential is developed that is proportional to several factors. The most important factors are the mass and magnetic characteristics of the test piece, the turns ratio of primary coil to secondary coil and the overall coupling coefficient (mechanical spacing) of the two coils and the test piece. The size and shape of the test piece has a pronounced effect on the coupling coefficient and thereby on the sorting instrument meter reading, also.

A second difference shown by the circuit of Fig. 2 is the synthetic standard, provided by the voltage ladder, against which the output of the transformer secondary is compared. Additional

Sorting Instruments (continued)

components are employed to enable the frequency and the magnitude of the exciting current to be varied and to measure phase shift and harmonics. This somewhat elaborate circuitry increases the versatility of the magnetic test and the amount of information that can be gained concerning the metallurgy of the test piece.

A third general class of magnetic sorting equipment can be recognized outwardly by the large cathode-ray tube screen on which it produces a wave form pattern representative of certain magnetic properties of the test piece. Cathode-ray equipment usually operates on frequencies well above 10,000 cycles per second and, in this range, is able to sort nonferromagnetic material as to chemical composition by measurement of its core loss. The block diagram shown in Fig. 3 represents a typical arrangement of circuits for high frequency magnetic sorting.

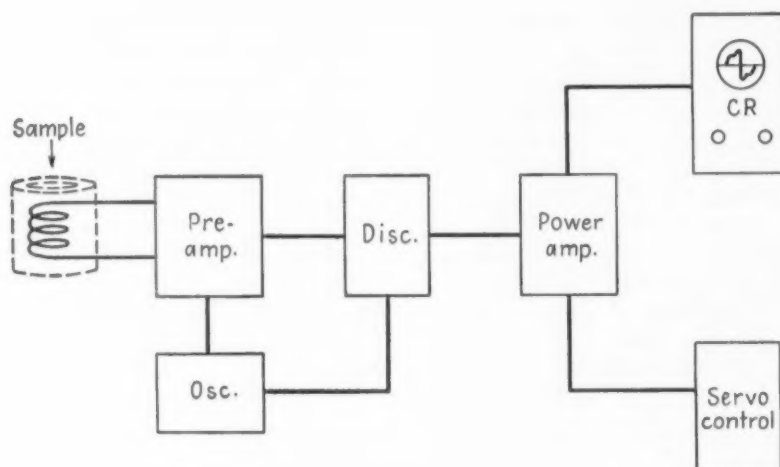


FIG. 3—Typical arrangements of circuits for high frequency magnetic sorting as applied in instruments having cathode tube ray screens.

Because of the manner in which a magnetic analysis test signal is produced, this type of equipment is particularly adaptable to automatic signalling when an undesirable analysis is detected. Conveyers and hoppers are available for feeding the test pieces into the equipment and discard mechanisms reject unwanted material entirely without human intervention, once the test has been set-up for a particular problem.

Virtually all of the ferritic, martensitic and austenitic grades of steels can be sorted by magnetic analysis equipment at low or high frequencies of exciting current. The most sensitive to magnetic sorting are the strongly heat-treatable, martensitic grades wherein the constitution after heat treatment has the most pronounced influence on the results. At the high frequencies used for nonferromagnetic materials, the size and shape factor of the material becomes quite critical.

An altogether unrelated physical effect, namely,

the triboelectric phenomenon, is employed by a sorting instrument of which there is only one type available at the present time. The instrument measures the electrical current which is generated when two alloys of dissimilar metallurgy are placed into frictional contact.

Any mechanical means of producing frictional contact between two pieces of metal may be used. The most convenient way of accomplishing this under the required conditions of control is a reciprocating motion of one of the pieces in contact and at right angles, approximately, with the other piece. This scheme is shown by Fig. 4, wherein a pulsed solenoid motor drives a reference specimen across a sample in a sawing motion under fixed load and stroke and for a fixed number of oscillations.

The reference standard, which is normally of the wanted metallurgy, makes electrical contact with the test piece and both are connected in series with a galvanometer indicator and a

polarity reversing bias control. The bias control compensates for residual thermoelectromotive currents that occur mainly at the contact of the reference and the test piece, and thereby to reduce the algebraic sums of the potentials throughout the circuit to zero at the galvanometer terminals. Every sorting test is started in this zero potential circuit condition and the potential resulting from the reciprocation of the reference standard across the test piece is then the only potential to which the indicator responds.

The triboelectric test is useful for sorting metals because degrees of metallurgical differences will produce corresponding degrees of difference as shown by the instrument indicator. No reading of the indicator will be obtained when the reference standard is metallurgically identical to the test piece.

The triboelectric test result is a function of both the chemistry and the constitution of the samples and, in this respect, suffers from the

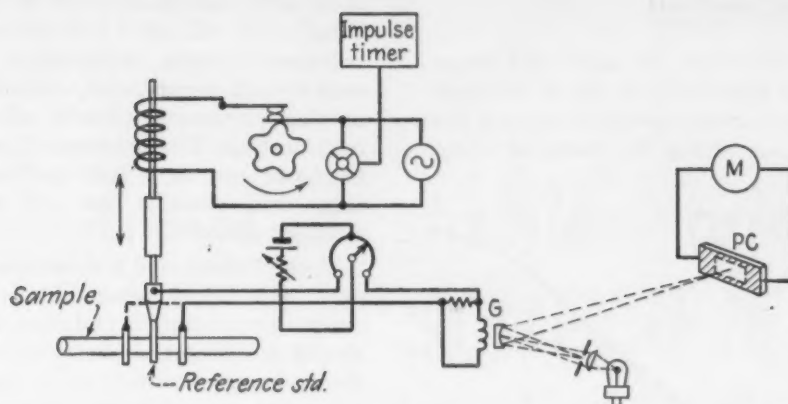


FIG. 4—General arrangement of the triboelectric test instrument, which measures the current generated when two alloys of dissimilar metallurgy are placed in frictional contact.

same possibility of interpretive confusion as magnetic analysis. However, differences in the sizes of the test pieces have very little or no effect whatsoever on the normal readings obtained from any two given analyses.

Another advantage of the triboelectric equipment lies in its ability to sort both ferromagnetic and nonferromagnetic alloys, and even graphite and electrically conductive rubber compositions, with almost equal ease. Its ability to sort material at the location of the mixup with a minimum of unbundling or displacement is a distinct advantage. However, the test requires a clean, metallic surface to which frictional contact is made, and is somewhat slower than magnetic testing.

Select standards carefully

Standards must be truly representative in every way of the material being sorted, no matter what sorting method is applied. True standards should reflect current mill practices as regards heating and working temperatures and time cycles or, in the case of machining operations, cutting speeds and coolants. Temperature-time cycle variations during the working of a hardenable alloy and some nonhardenable ones, also, affect the metallurgy of the alloy; it is quite likely that any sensitive sorting instrument will detect such variations even though the metallurgy is within acceptable limits.

Prepared standards should be "prepared" only in the sense that they have been selected to represent all normal and average conditions that can be expected in a given production operation. Even so, the extremes of certain conditions may sometimes overlap, in which case it is only necessary to reject the pieces showing overlapping readings and refer for chemical analysis. The number of such pieces will usually represent only a small percentage of the mixup.

In the commercial embodiment of the triboelectric sorting instrument, a reference standard in the form of a 3 x 1/4 in. diam bar is reciprocated under constant load, velocity and time

cycle over a cleaned portion of the surface of the sample. Ordinarily, the instrument is built to operate within the range of its most linear characteristics. However, due to the metallurgical nature of some alloys when used as reference standards, the triboelectric test indicates a strikingly nonlinear function.

For triboelectric sorting, it is not always necessary to employ standards which are completely representative of the mixed lot of samples. In cases where the sample is metallurgically foreign to the material being sorted, the separation of mixed analyses is made by a difference reading. Since size of the sample has no bearing on the test, these difference readings are indicative of the true state of affairs as determined from previous calibration of the effect of metallurgy only.

Tests should be made at correspondingly identical positions and in the same orientation on every sample of a given mixup. Whether the test is a magnetic one or a triboelectric one, the sections should always correspond on each piece.

Residual magnetization is a bugaboo to magnetic sorting equipment and its manufacturers offer an assortment of different sizes of demagnetizing coils for use with the equipment. Magnetization does not affect the results of the triboelectric test at all; its bugaboo is clean, metallic surface, which should be obtained by use of a portable belt sander when mill scale or other encrustation is present.

Several grades sometimes involved

Large mixups occasionally involve several grades of widely varying analyses and, possibly, constitutions. This situation is prevalent in large machine shops and results from machine operators tossing usable bar ends and partial length into the scrap. A collector generally empties out the scrap bins and delivers the pieces to a specified place. The situation is usually hopelessly confused in spite of painted ends, which lose their significance through the action of grease, grime, coolant and chips.

The pieces should first be sorted accurately ac-

cording to size (diameter, if bars) and shape. This is absolutely mandatory if any of the magnetic analysis instruments are to be applied. For triboelectric testing, sizing the material is not

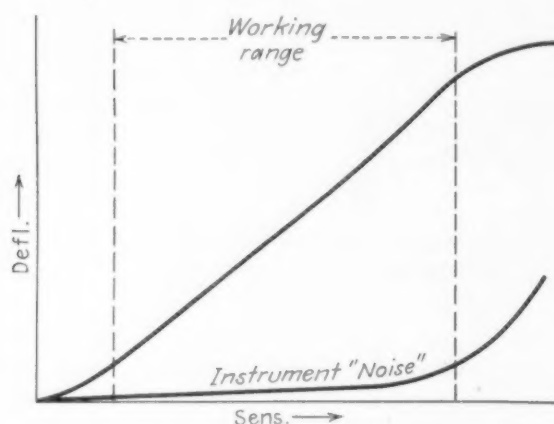


FIG. 5—Curves showing a customary instrumental signal-to-noise condition. Stretching the sensitivity of the instrument outside of the working range indicated can produce trouble.

necessary but is still good practice. Second, one member of each size group is chosen as an empirical standard and the other members of the group compared to it.

Then—if a magnetic method is being used—one member of each group should be compared to a known standard of identical size, if available, for identification of analysis, or one member of each group sampled for chemical check. If the triboelectric test is used, pieces can be grouped according to their similarity of readings, regardless of size differences, and referred against two or three known standards for positive identification.

The mathematical expression of a signal-to-noise ratio evaluation of an instrument defines the proportion of an instrument meter reading (signal), due to the reaction of a test, to the spurious component present (noise) that adds to the meter reading but is not a part of the pure signal. A high signal-to-noise ratio, that is, a large amount of noise present in the signal, is detrimental to the accuracy and utility of the test; the noise component will almost invariably mask or confuse the test.

Instrumental noise is usually quite low, expressed indirectly by the manufacturer in terms of per cent inaccuracy of the instrument—the average value for instruments operating under hard use conditions being about 5 pct of full scale. Fig. 5 illustrates a customary instrumental signal-to-noise condition; note that trouble can be expected if the sensitivity of the instrument is stretched too far.

Fig. 6 illustrates a possible condition of signal-to-noise which is caused by the so-called immaterial variables of the test sample itself. Hard-

ened areas are an example of immaterial variables which will affect both the magnetic and the triboelectric tests. Eccentricity of tubing bore, even though commercially acceptable, constitutes another immaterial variable affecting only magnetic testing. The presence of an extremely thin hardened case on a test surface is still a third immaterial variable that will affect the triboelectric test only.

These factors, and a great many more possible ones, sum up to what may be termed sample noise—a most serious and disturbing attribute of almost any material that has been subjected to the action of extremely high temperatures, pressures and stresses during production.

There are not too many ways in which sample noise effects can be avoided, but they can be reduced to a minimum hazard. In this behalf, one more generality applies to the use of metals sorting instrumentation of whatever kind; the equipment should always be operated at the minimum sensitivity that will clearly define a required separation.

Since it has been shown that one instrumental method of sorting is slightly superior to the other in some respects, and vice versa, and since many things can happen to make mixups as obdurate as can be imagined, it seems logical to place both the magnetic as well as the triboelectric instrumentation in the hands of a competent operator. The first cost of the sorting instrument itself is extremely moderate in view of the jobs that it can do in metalworking plants.

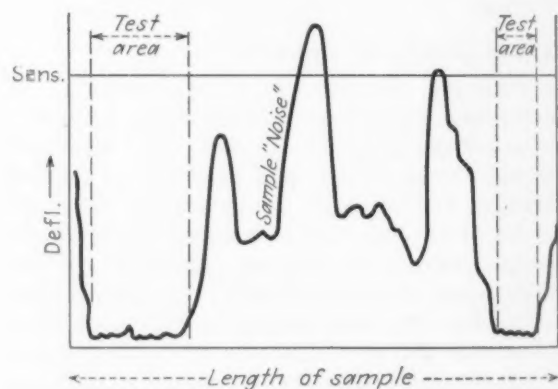


FIG. 6—A possible condition of signal-to-noise, caused by immaterial values of the test sample itself.

Between times that the operator is not working on an actual mixup, he can be kept busy on a quality control program or use his equipment to aid experimental and research studies in the plant. Much can be learned about the presence of localized stresses and strains through triboelectric or magnetic testing equipment. A mill record, or some other foreknowledge of which analyses could be represented in a mixup, means that half the sorting battle is over and positive identification of mixed material is quickly assured.

Identification of 3 stainless alloys SIMPLIFIED



A. W. Smolla

Chemical Analyst

Chemical Laboratory

Park Works

Crucible Steel Co. of America
Pittsburgh

A fast, accurate means of identifying stainless steels, Types 316, 321 and 347, has been developed at the Park Works of Crucible Steel Co. of America. A qualitative chemical method is used. The search for this new technique was undertaken to bypass the limitations of the various available electrical identification systems as well as the spot tests.

This method uses side trim or end scrap, avoiding time-consuming milling or drilling operations. It will produce identifying results in a matter of seconds.

The equipment required to conduct tests by this method consists of 150 ml beakers, sheared scrap pieces, chemicals, and heat. Adjacent beakers containing stainless Types 302 or 304 are used as control samples during the test.

The test pieces of scrap used in the following description were approximately $1 \times 1\frac{1}{2} \times 4$ in. However, the method is effective with any size piece which can be conveniently placed in a 150 ml beaker. The actual techniques used in identifying Types 316, 321 and 347 stainless are detailed below.

Type 316 contains from 2 to 3 pct molybdenum. The object, therefore, is to determine rapidly the approximate amount of molybdenum present. An addition of 10 ml of perchloric acid (60 pct) is made and the beaker is placed on the stove until reaction begins. On a hot stove this requires not over 20 sec. The sample is removed from the beaker and the beaker is removed from the stove. The solution is diluted to about 30 ml with water. Five ml of sodium thiocyanate solution are then added, followed by 10 ml of stannous chloride solution.

The limitations of the available electrical systems are bypassed by this qualitative chemical method of identifying Types 316, 321 and 347 stainless. Side trim or end scrap is used and only beakers, chemicals and heat are required for the identification.



IDENTIFICATION of steel samples by the conventional—and older—drilling or milling method, being performed by Albert Heimann, supervisor of Park Works Chemical Laboratory and co-author of the new method described here.

A decided reddish color will indicate the presence of the molybdenum. The solutions required are these: A) 60 pct perchloric acid; B) sodium thiocyanate—50 g dissolved in 1000 ml of water;



ALL STEPS involved in the more rapid method of identifying Types 316, 321 and 347 stainless are shown here. Only the number of beakers and the amount of stove space available limits the number of specimens that can be tested simultaneously.

C) stannous chloride—250 g dissolved in 200 ml chemically pure hydrochloric acid diluted to 1000 ml with water.

Type 321 contains approximately $\frac{1}{2}$ pct titanium. The object is to identify the titanium. In general, the same practice is used as is employed with Type 316, except that the dissolving time would be slightly longer, approximately 30 sec.

After diluting to 30 ml with water, one or two drops of hydrogen peroxide are added. If the sample contains titanium, a distinct brownish color will result.

Type 347 contains approximately $\frac{1}{2}$ to $\frac{3}{4}$ pct columbium or columbium-plus-tantalum. In this procedure, considerably more metal has to be dissolved. Approximately 60 sec in perchloric acid is sufficient. After removing sample, add a few drops of hydrofluoric acid. The sample is then fumed. The beakers are then removed from the stove and diluted to 30 ml with water. The presence of columbium or columbium-plus-tantalum will be indicated by a distinct cloud or white precipitate.

In all three of the above determinations, the control samples of stainless 302 or 304 are run in adjacent beakers for comparison.

In the accompanying photograph, each of the steps noted in the techniques described above are illustrated. It can be readily seen that the number of samples identified is limited only to the availability of beakers and stove space. In the Park Works laboratory it is not unusual to run over one hundred specimens simultaneously.

Rotary fixture welds a plowshare a minute

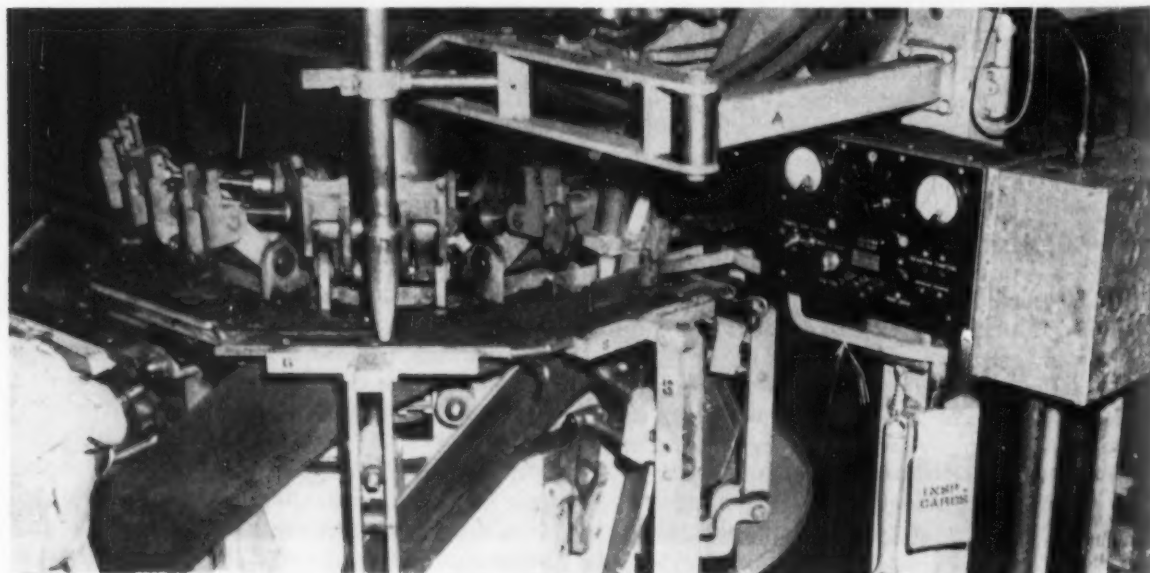
Use of an 8-place rotary fixture has increased the production of welded plowshares by 10 pct. The plow consists of a die-cut gunnel and a forged share, which are welded together. The rotary fixture in the Allis-Chalmers plant at LaCrosse, Wis., holds the parts of the plowshare in position and moves them under a Unionmelt welding head at 19.1 ipm.

Since the share moves in a circle beneath the welding head, while the joint to be welded is a straight line, the fixture had to be designed to move the welding head also, so that the com-

bined motions result in a straightline weld. The problem was solved by using an 8-faced cam which causes the welding head to swing in and out; this combines with the circular motion of the table and produces the desired result.

With one man to load the fixture and another to unload it, production of the machine averages from 60 to 65 completely welded plowshares per hour. In addition to giving a 10 pct boost to production, the machine-welded plowshares are stronger, longer-wearing and better fitting than the ordinary forge-welded plowshares.

PLOWSHARES are welded automatically with Unionmelt equipment as they pass beneath the welding head of this unit.



Suggestion Systems Pay

BIG DIVIDENDS

By G. B. Roberts

Secretary, Suggestion Plan
Crucible Steel Co. of America
Midland, Pa.



Both the employer and the employee can realize substantial returns from a worthwhile suggestion system. Such plans are being used in the steel industry, but high cost of instituting major changes sometimes requires extensive waiting periods. The suggester receives 10 pct of the net annual saving.

Suggestion systems have in one form or another been a part of the American industrial scene for about 50 years. However, they have met with only indifferent acceptance throughout the steel industry.

The reason for this is simple. There is an average capital investment of about \$15,000 for each productive worker in the steel industry. It is estimated that new plant facilities will cost about \$25,000 per employee. Alterations to the basic units of coking, smelting, reduction, rolling, annealing and finishing process will in almost every instance result in appropriations and expenditures that will be reflected in the taxable worth of property inventories. In view of this, the cautious attitude of the steel industry in the suggestion field appears based on sensible reasoning.

Payment follows trial period

It has not, however, closed the door to the profitable and successful use of the suggestion plan. A worthwhile suggestion plan in the areas of production will be justified by a display of tangible results that are reflected dollarwise in increased output, reduced material costs, or smaller maintenance burdens. Improvement in these centers is indicated directly in the budget and cost statements of the affected departments.

The suggestions which have been submitted, accepted and awarded at Crucible Steel Co. of America are in 55 pct of the cases suggestions

that had as their basis the revision or alteration of existing equipment. The company only accepts and awards suggestions after they have been tried and have become a definite part of practice or equipment. Following installation, trial periods will sometimes extend for several months.

Sometimes require long wait

For example, there was a suggestion for revising the closing mechanism of an ore bridge bucket in the blast furnace. The original suggestion was received Jan. 8, 1948, and was finally awarded on Sept. 1, 1950.

At the time of receipt it was recognized that this idea was sound and would effect an annual savings of about \$700. The suggestion could not be applied without first removing the 11 cu yd bucket from the ore bridge and replacing it with a substitute. This would require a considerable amount of time on the part of maintenance and repair crews. The bucket would have to be transported by flat car to the structural shop, unloaded, and torn down to a point where the necessary structural changes could be made.

After making the suggested change, the process of assembly loading, transportation and restoration to service would add its expense to the project. The estimated cost for completion of this suggestion indicated that the annual savings could not justify such expense. With this in mind, it was decided that the alteration should

Suggestion systems (continued)

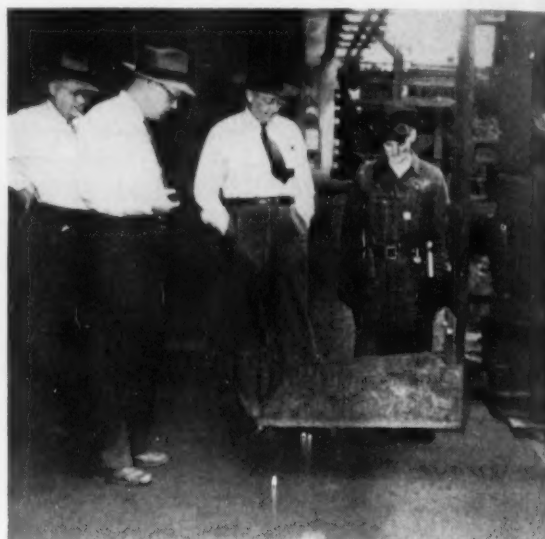
be made to this equipment when it would at the end of its normal period of service be routed to the repair shops for a complete rebuild.

Thus, the only expense chargeable to the suggestion was for the time and material necessary to make this minor change. The teardown, transportation and other charges were applied to the shop order which would have borne them either with or without the suggestion. As a result, the suggestion was completed for only \$27.00, the

Most of the suggesters seem to arrive at solutions that are beautifully simple. They do not become confused by a lot of complicated, involved thinking. They use common sense, and usually approach a problem with the thought of simplification in their minds, or they are trying to make their jobs easier. As a further example of the need for waiting, a suggestion was received almost 2 years ago for revising and simplifying the valve control mechanisms on a series of furnaces. The present installation includes heavy castings, motors, shafting, wire cable, switchboards, structural members, limit



OPERATOR'S-EYE VIEW of ore bucket bridging. A suggestion proposed a simple revision of this mechanism; the change saved \$700 per year in the cost of closing cables and was completed for only \$27.00.



PLANT EXECUTIVES inspect a scoop which clears sticker coke ovens, developed by award winner Howard Pitts, right. Left to right are C. V. Thompson, Coke Works Supt; G. E. Muns, Fuel Div. Mgr; and W. R. Howell, General Supt.

cost of a shaft and roller. By projecting the installation to a time almost 34 months away it was possible to use the idea with profit to both the suggester and the company.

The average award this year at Crucible has been \$85.00 per suggestion. These awards are based on the commonly used formula which allows the suggester 10 pct of the net annual savings.

Suggesters are never allowed to remain ignorant of the treatment that is being given to their idea. If it has a potential value and can be developed to a useful degree, it is fully discussed with him. He is told why it cannot be installed immediately.

In the above case, a conference was arranged between the chief engineer and the suggester; other discussions were held between the suggester and the combustion engineer. Following these discussions, the suggester was told why it was necessary to delay installation until it would find its proper niche in both the fiscal and production pictures.

switches, solenoids, counterweights and a multitude of small parts and materials. The cost of these installations is a huge amount.

The proposal submitted by this suggester will, through simplification, eliminate an expenditure of about \$25,000 for control mechanism components. It will produce a further benefit of reduced maintenance costs that should be in direct ratio to the reduction of working, moving parts.

Here, again, the company was faced with a sound and desirable revision that would require a huge expenditure. And again, it was necessary to wait until the life expectancy of existing equipment had been fully realized. Then, in the rebuild that would be a part of normal equipment replacement and for which reserves had been accumulated, the suggested revisions would be incorporated. This project is now in the plans of the company, and authorization for an appropriation to cover its installation has been requested.

Occasionally, a suggestion is submitted which

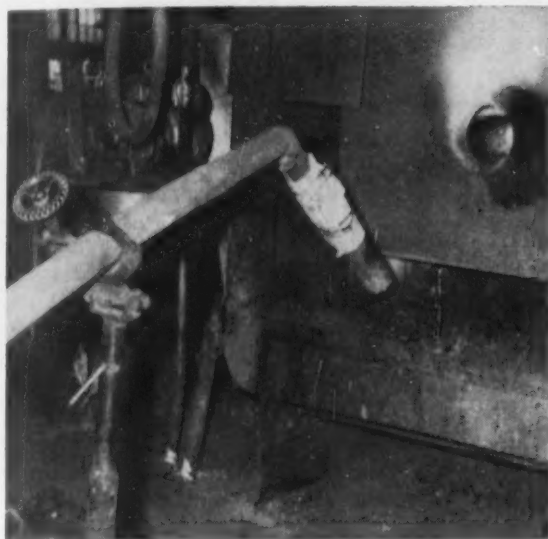
can be compared to the fire extinguisher on the wall. You hope you will never be forced to use it; but when need for it arises, it has huge worth. One outstanding suggestion in this "fire extinguisher" group was received.

This proposal outlined an idea for mechanically clearing sticker coke ovens. While sticker ovens are not a normally present problem, they will occasionally occur. When this happens, the removal of the oven charge is a nasty, dirty and tedious job, usually performed manually with hoes, rakes and shovels.

Attempts to expedite this cleaning have led

The charge was removed to a point past the soft center with the scoop and the remaining coke was then pushed in the normal way. This effected a 75 per cent reduction in man hours per sticker oven. The company gained an earlier return to production, large labor savings, salvaged coke that would otherwise have been lost, and paid the successful suggester \$465. Again, it paid both the company and the suggester to wait.

A recent large award was paid to a worker in the Electric Melting Dept., for greatly increasing the life of a tool used in the carbon reduction in electric furnace steels. Pure oxygen



CHANGING the refractory material ingredients extended the life of these oxygen tips a minimum of four times. Aside from the other benefits of this suggestion, the annual cost of materials was reduced more than \$3000.



TECHNICAL AND OPERATING skills are joined when G. W. Snyder, Combustion Engineer, and E. F. Frederick, Heater, discuss proposed changes in soaking pit valve controls. Mr. Frederick's suggestion is now part of Crucible's plans.

to use of a number of methods in different coke works. None of them, however, have been satisfactory and the cost of cleaning has remained on a level with that of manual cleaning.

The suggester devised a scoop for attachment to the ram on the pusher. It could be attached to the ram in approx 5 min; it cleaned effectively, and was self-dumping. It had only one shortcoming; it would seldom be used. The company waited from June 1948 until November 1949 for an opportunity to use this scoop on a scale that would save time and money in worthwhile amounts.

During the steel strike from late September until Nov. 18, 1949, following common practice, the coke ovens were left full of coke. At the conclusion of the strike it was found that air had slowly infiltrated many of the ovens near the center of the charge causing a partial, slow combustion of the coke. This softened the coke mass structure so that the coke could not be pushed from the ovens in a normal way.

Here was an opportunity to use the scoop.

for this purpose is introduced through a water-cooled tube, the end of which is subjected to extremely high temperatures. This end piece or nozzle, referred to by furnace men as a "bomb," is composed of refractory materials. The life of these tips was measured in minutes, and it was often necessary to change three or four tips during a heat.

This suggester developed a heat resistant refractory mixture which extended tip life approximately four times. One nozzle now effects the required oxidation. Savings on nozzles alone are in excess of \$3000 per year. The suggester received encouragement in every step of his thinking from his department superintendent. This is considered so important that a prize is awarded to the first level supervisor who has the greatest number of worthwhile accepted suggestions from people who are his supervisory responsibility. The top suggester for the year also receives an additional award.

The foremen take pride in having smart workmen in their department. They check closely on

Suggestion systems (continued)

the monthly report of contest standings of suggesters and foremen.

The suggesters in these four cases were all men of different skills and training. They were, respectively, a crane operator, a millwright, a heater, and a laborer. Other suggestions come from all areas of activity and from all groups of employees.

A suggestion plan must show a profit on the balance sheet in order to justify its existence. If the plan operates at a loss, it becomes just an expensive bit of trimming in the window of industrial relations.

A successful, well-rounded plan will not have a participation that is exclusively in the theaters that will return large savings. It should include constructive suggestions that will improve safety, welfare, and employee morale through proposals that will contribute to better working conditions, convenience, or the elimination of hazards. These things are valuable but, in themselves, they are not enough to attract the favorable attention and acceptance of the steel industry as a whole.

There are in addition to these factors other values that are rather difficult to evaluate. One that has become increasingly apparent developed out of the method of suggestion investigation. This intangible value is exemplified by the practice in one department.

The basic analysis is made by the Turn Foremen who are in charge of this department on the three shifts that cover a 24-hr operating period. Each foreman submits a written reply to a set of basic questions covering the suggestion. The result of this practice has been a pronounced increase in the knowledge of the foreman in regard to mechanical structures and devices that, while in his consciousness, had been only obscurely apparent.

Analytical thinking becomes habit

This has had a good effect for, like everything else, this analytical thinking becomes a habit. One of the superintendents said the other day, "If we received no other benefit from the suggestion plan, it would be worthwhile because it has made better supervisors of my foremen." When they see an effect they instinctively look for the cause.

Suggestion systems, when tailored to fit the circumstances that are peculiar to the steel industry, will show a profit and return a yield of valuable byproduct benefits. Despite the terrific strides that have been made in technical fields by steel, there is a tremendous opportunity for betterment through the suggestion plan.

Every mill, by the time it is well shaken down, has had the bugs removed by the skill, the feel, the know-how of the rollers, the guide setters, shearers, millwrights, or other operators or mechanics. They see and correct the little and

sometimes big faults that always seem to be present in machinery. Steel making equipment acquires character through its use and adjustment.

However, management at Crucible is not given to growing starry-eyed over the possibilities of using the tremendous reservoir of grass roots engineering that is available in the minds of its plant personnel. A practical, down to earth approach that will return a profit to the suggester and to the company is used.

The suggestion plan can be forged into an effective tool for realizing a greater yield from present equipment, a greater profit on present investment. Greater efficiency is the only solution to meeting the stresses that will come tomorrow.

NEW BOOKS

"Oxygen Cutting," by G. V. Slottman and E. H. Roper, provides the metalworking industry with an authoritative manual of practical oxygen cutting techniques, as well as a summary of present-day knowledge of the subject. In addition to fundamental information on the action of the cutting jet and the mechanism of the process, the book includes discussions of the many uses to which oxygen cutting may be applied, and presents interesting historical background material. McGraw-Hill Book Co., 330 W. 42nd St., New York 18. \$6.50. 408 p.

"Experimental Spectroscopy," by R. A. Sawyer. This second edition on what a good experimental spectroscopist ought to know gives thorough treatment to the design, adjustment and use of all the modern types of spectrographic equipment which are in ordinary laboratory use. Chapters include information on grating mountings and use, infra-red spectroscopy, ultra-violet spectroscopy and spectrochemical analysis. One section on general principles contains discussions of several topics that relate to spectroscopy. Prentice-Hall, Inc., 70 Fifth Ave., New York 11. \$6.65. 358 p.

"Metal Processing," by O. W. Boston, offers the latest technical and scientific advances in machine shop practice, specifications and standards. This second edition supplies information for the complete preparation of process routings including the selection of machine tools, cutting tool materials, tool shapes, power, speeds and feeds, and all the accessories involved in the plant layout for manufacture. The book shows that, in order to produce a good product at low cost, its design, metallurgy, and production must be carefully correlated. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16. \$7.50. 764 p.

news of industry

BORON STEELS—Only Hope for Civilian Users

First boron convention held in Detroit . . . Metallurgists told even less alloy will go to civilian . . . Boron steels a must . . . Quick work saves the day for civilian uses—By D. I. Brown.

Detroit—Very little alloy steel is now available for civilian use and it may even be cut off entirely by the end of the year. Also, certain military orders already downgraded will have to use the new boron steels for lack of alloy.

These facts were divulged at the meeting of the Society of Automotive Engineers iron and steel technical committee, Div. VIII, boron steels, in Detroit last week. Over 100 metallurgists attended this first boron convention. The committee, under the chairmanship of H. B. Knowlton, of International Harvester Co., heard E. J. Hergenroether, assistant director, Metallurgical Conservation Board, Iron & Steel Div., NPA, Washington, say, "Present demands for nickel and molybdenum exceed supplies by about 2½ times."

No Cobalt, Tungsten

Because of the jet program, there is, practically speaking, no cobalt or tungsten available for anything else except tool steels. Demand for chromium only exceeds supplies by about 25 pct so that boron and boron alone will have to carry the impact of war on civilian and military production."

Because of the present severe alloy shortage, even the old NE (National Emergency) steels of World War II are too rich in alloy. The new leaner boron steel grades announced by the American Iron & Steel Institute in March take their place but even these steels, may not be approved by NPA for civilian goods.

These grades, 80B00, 81B00 and

94B00 boron steel series developed by AISI and SAE are the most highly alloyed grades which are likely to be made in large tonnages. Most of the alloy in them is secured from scrap residuals. Little virgin alloy is needed. There is some doubt that NPA can long continue to approve melt schedules on any alloy requiring use of virgin alloys except possibly chromium and manganese.

New boron steels under development are being built around a plain carbon chemistry with a manganese range of 1 to 1.50 pct. However, there is evidence that in case of a "shooting" war the United States may be forced to fly manganese into this country from overseas. Other leaner alloys recently developed use a lower manganese with a little added chromium. The low-alloy, high strength steels will not be OK'd on melt schedules, except DO's, unless all alloy for such grades is obtained by remelting scrap.

Boron is the only bright spot in an otherwise dark alloy picture. Luckily domestic supplies of borax from which the ferroboration alloys are made are plentiful. Boron will replace a couple of hundred times its own weight compared to nickel, chromium and molybdenum to effect the equivalent hardenability of these three alloying agents. Only a minimum of 0.001 pct boron by weight is needed to produce the maximum properties in steels which are heat treated.

The new boron steels are in pro-
Turn Page

Iron Ore Option

Ciudad Bolivar, Venezuela—A U. S. company, said to be Cleveland-Cliffs Iron Co., has reportedly taken a 2-year option on the Trueno iron deposit for a consideration of about \$50,000. If option is exercised, the price will be \$1 million. The deposit contains approximately 60 million tons of high grade ore. It is situated upriver from here, between Cerro Bolivar of U. S. Steel and the Orinoco River.

Another source reports that a Venezuelan government agency has been formed for the dredging and operating of the Orinoco River estuary to be used in moving ore from U. S. Steel's deposit.

Republic Buys RFC Plant

Washington—RFC has sold its steelmaking facilities at Canton, Ohio, to Republic Steel Corp. for \$1,534,391.

Sale price, plus rentals in the past 10 years, amounted to more than the government's original investment, RFC said. The plant was built in 1941 under Defense Plant Corp. orders. It has a capacity of 125,000 net tons of steel ingots per year.

Steelmen Bid on Korean Scrap

Washington—Major U. S. steel companies have filed bids with the Korean embassy for 100,000 tons of steel scrap. Valued at more than \$1 million, the scrap was first offered as a gift to the U. S. Government. The gift was refused, as a matter of policy.

INDUSTRIAL SHORTS

New Subsidiary — Kropp Forge Co., Chicago, has formed a new wholly-owned subsidiary, KROPP FORGE ORDNANCE CO., to operate the forge plant at Melvindale, Mich. The plant is now being readied for defense production. It was acquired last November from Detroit Ordnance Tank-Automotive Center.

Container Plant—To better serve expanding fruit and canning industries in Pennsylvania, Maryland, Virginia, and West Virginia, AMERICAN CAN CO. will build a new metal container plant near Harrisburg, Pa. It will have a capacity of 400 million food cans per year.

New Owner—All outstanding stock of PRECISION TOOL & DIE CO., Bronson, Mich., has been purchased by Oliver Goshia, former Toledo stock broker. Precision makes tools, dies, fixtures, and plastic molds. Mr. Goshia will join the management team.

Into Electronics — Willys-Overland Motors, Inc., has established an ELECTRONICS DIV. It will work on two developmental contracts in the electro-mechanical field.

French Firm — Yoder Co., Cleveland, has agreed to pay \$74,000 to buy a 51 pct capital stock interest in the FRENCH COMPANY, SOMENOR, which will make the Yoder line. ECA has guaranteed that \$205,000 in profits and royalties will be converted into dollars for Yoder. Somenor products involved will be equipment for making steel pipe, tubing, steel shapes and moldings from strip and sheet, and rotary slitters.

Helping Housing—Prefabricated homes will be produced at a factory to be opened soon in Flushing, Mich., by SHARP HOMES, INC., Flint, Mich. The plant was formerly occupied by Reynolds Spring Works.

Change of Name—To reflect ownership and management, the name of Brandt Iron Works, San Antonio, Tex., has been changed to CAMPBELL STEEL CO.

Sales Divisions—Consolidation of sales divisions and new managerial appointments have been announced by INLAND STEEL PRODUCTS CO., Milwaukee. Inland's sales divisions were cut down from six to four. The heating and ventilating products and sheets and roofing products divisions became the sheet metal products division. The metal trim and metal lath were united under the latter's name.

Exclusive Basis — All sales and distribution of American Forge & Mfg. Co.'s ratchet type load-binder will be handled on an exclusive basis by CANTON CAST PRODUCTS CO., Canton, Ohio. E. M. Smith, of Canton Cast, will direct sales activity.

Rotary Kilns—Standard Steel Corp., Los Angeles, will build two rotary kilns for Manganese, Inc., Henderson, Nev. Ten ft in diam by 150 ft long, the kilns will be installed as part of Henderson's \$2.5 million manganese ore plant.

New Company—Formation of FRANKI FOUNDATION, Pittsburgh, was announced by Arthur J. Bulger, newly-elected chairman and president. The firm will engineer and install industrial and commercial foundations.

Elect Officers — George W. Mason has been reelected president of the AUTOMOBILE MANUFACTURERS ASSN. Other officers are: H. S. Vance, Studebaker, E. J. Bush, Diamond T, vice-presidents; H. H. Curtice, GM, secretary; H. J. Ferry, Packard, treasurer; A. Reeves, advisory vice-president; and W. J. Cronin, managing director.

duction and are being used in limited quantities for gears, bolts, pinions, shafts, springs, etc. Steel consumers haven't fully awakened to the facts yet, but within 30 days those who haven't yet investigated and proved out their practice for the new boron steels will be forced to.

Only through the farsightedness of the AISI and SAE, plus certain government agencies, is the U. S. in any position to continue to make civilian goods requiring alloy. They saw the handwriting and in 3 months accomplished what took over a year to do in developing the alternate alloy steels of World War II.

Right now between 45 and 60 pct of all alloy steel is going into defense. Shortly 70 pct will be controlled. On the June melt schedule, NPA approved about 1½ million tons of alloy. Over 1 million lb of nickel and molybdenum were saved by downgrading and substitution. This is but the beginning of a program which may see all the old grades rich in alloy disappear from use in anything except the most crucial military applications.

Army of Clerks Take Basic Training for Allocation Battle

Washington—About 200 officials from NPA's 105 field offices last week completed a condensed training course in preparation for processing fourth quarter requests for allocations of CMP materials.

Nearly 300 more are in the process of being hired and trained for the work.

Eventually the bulk of allotments of materials under CMP will be made from field offices. Just where the line will be drawn between home and field office processing has not yet been decided.

NPA hopes the field offices can take over the brunt of the burden for the fourth quarter. But, due to the time element, all third quarter allotments must be made from Washington.

As a result of the NPA decision to allot materials to all B product producers filing requirements,

some 40,000 individual requests must be quickly processed. The number will be greatly increased for the fourth quarter and when all production comes under CMP.

NPA is unwilling to estimate, even roughly, how many people must be obtained and trained for handling the multitude of materials applications. But present plans call for a minimum of five for each

of the large regional offices and at least one for each district office.

In the meantime Defense Dept. and Atomic Energy Commission applications are getting top priority in processing. These are expected to be out in time to apply to August production. Bulk of the remaining requests, however, are not likely to affect mill schedules before September.

BRASS—Fit For Defense, Tied up by Shortages

Mills are ready for defense . . . In better shape than before . . . But shortages, controls hurt . . . Some face shutdowns and loss of workers . . . Want slower stockpiling—By Bob Hatschek.

Naugatuck Valley, Conn.—The brass mill industry stands ready and able to take on all the work the defense effort can demand—and then some. The industry is in a far healthier state than it was in before World War II. But it is being starved by shortages and stymied by price confusion and controls.

DO-rated work and directives are taking anywhere from 32 to almost 50 pct of current output and some companies are fairly busy. Others are facing imminent shutdowns for lack of materials and all of them could take on more work if they had more copper. Other industries growing in and around Connecticut, notably the aircraft industry, are able to offer steadier work and higher pay in some cases with the result that skilled labor is drifting out of the mills.

Casting from Cars

Mills are literally scraping the bottom of the supply barrel with negligible inventories and are practically casting right out of freight cars. One company is even putting riders on freight cars to make sure that copper is not delayed en route. Ten years ago the opposite was true; inventories were high, the supply pipeline was full and scrap was available.

Many in the industry feel the first step in alleviating the cur-

rent shortage would be to further curtail or eliminate the already slowed government stockpiling program. They say that armed forces reserves of copper, estimated at 100 million lb, should be distributed to industry on a historic consumption basis. All copper scrap should also be allocated to where it would do the most good and National Production Authority has already proposed an amendment to M-16 which would take care of this.

The price problem is another obstacle. Chilean copper costs 27½¢ per lb while mill product prices are pegged on the basis of 24½¢ copper. To be sure, the 2¢ import duty has been removed but the

practice there was to charge that item separately to the consumer and this cannot be done with the 3¢ bonus. (See p. 156.)

U. S. Subsidy Helps

Suggested solutions to this problem are many and varied. One brass mill executive feels that a 3¢ government subsidy would be enough to assure sufficient supplies. Another wants to add marginal domestic mines with no stated limit on the subsidy. Others suggest raising the ceiling and one even prefers a completely free market. Everyone wants a ceiling put on copper scrap immediately.

The consensus of brass men interviewed by THE IRON AGE was that allocation controls are a necessary evil and if we must have them, let's have them efficient and complete. Nobody wants the job of dishing out defense leftovers to his regular customers.

One excellent point on the subject of controls that has not heretofore been stressed is that the copper situation differs radically from both aluminum and steel and yet the government has so far lumped them into a single CMP category. While both the steel and aluminum industries can and are being expanded, the copper industry here is about at its limit.

Wanted: Washington Realism

There are some domestic marginal copper operations which can be dragged back into production but today's high demand calls for another source—imports. The copper shortage is a worldwide condition and some countries are paying as high as 50¢ per lb for the vital metal. This calls for some realistic thinking by the government and may even require an international materials agreement.

After these problems are licked and the brass mills are producing at a high rate, some executives fear that the bubble may burst. They are afraid that the government may just cancel all orders. This would mean one big bust for the brass mills as well as other industries and one that would fall with the suddenness of a guillotine.



"Next!"

TOOLS—Price Relief, Pool Order Advance

Pricing relief order expected early this week . . . To make more production possible . . . Field needs materials, equipment, manpower . . . More subcontracting now—By Bill Packard.

New York—The machine tool industry early this week was expecting OPS to release its special pricing order which will remove some of the production roadblocks set up by CPR 30 (deadline July 2 for new machinery).

The coming order deletes some of the inequities which put the lid on machine tool production just when defense demands are being built up to a massive scale. The order allows the following additions to the pre-Korean base: (1) Overtime payments, (2) increase in shift premiums, (3) subcontracting costs, and (4) the right to redetermine ceiling prices as additional costs turn up.

Cash on Pool Orders

Another feature energetically sought and won by the industry is an automatic 30 pct advance payment on pool orders. This may free some companies from lack of cash difficulties and permit them to turn full facilities to defense.

Results of pricing relief and cash for pool orders will be: (1) More overtime, increased hiring, and ability to protect the industry's working force, (2) expansion of apprentice programs, (3) addition of the second shift if needed, (4) greatly expanded subcontract-

ing activity, and (5) general acceleration of machine tool output.

Machine tool men had been warning that, unless Washington policy makers quickly switch the tool traffic light from amber to green, some military production programs wouldn't stand a ghost of a chance of getting started on schedule. Vital tools won't be delivered on time. Despite Washington plans to ease this situation, many in the field believe that some damage of delay may have already been done.

In the many machine tool plants IRON AGE editors have visited during the past few days the need for more material is a constant cry. Invariably tool makers point to their high priority during the last war. Then they ask, "Are we any less essential today?"

Puzzling Paradox

The same is true of equipment needed to build tools. Some plants have found it impossible to get the equipment they need to balance out an extra shift.

They are all frankly puzzled by the paradox of pressing urgency for tools without sufficient priority to get them built. The only variant is in their aggressiveness. Here's what one builder had to

say: "Nobody knows what the score is . . . If they really want this stuff they'd better start acting like it." Another comment: "No matter what they say . . . our job is to build machines, and we're going to do it . . . We aren't letting these restrictions (material and price) hold us down."

Tool builders have their manpower troubles—the same as a lot of industries. Theirs are more acute than some because of the great skill needed. Most of the larger companies have labor training programs.

Subcontracting to Help

Although these programs are helpful, they don't solve the problem because many employees leave after they have acquired some degree of skill. Several other industries, especially aircraft, have found to their satisfaction that machine tool training programs are good basic training for a variety of skills.

Machine tool builders want to subcontract. Some of them fear getting caught with over-expanded plant capacity, and they believe subcontracting is the answer. The main thing that has been holding them back is that pricing regulations didn't allow for cost increases resulting from subcontracting. One large builder told THE IRON AGE it would like to let subcontracts for entire machines.

Italian Steel Emerging From Blows of War Damage, Dismantling

Rome—The Finsider Co., producing about 67 pct of Italy's crude steel, has shaken loose from handicaps of war damage and German dismantling. Although demand still outpaces output, Finsider can now produce over 1 million tons of steel per year.

It has pushed pig iron output in the first quarter of 1951 to 38 pct over the same quarter last year with the firing of the Piombino blast furnace. Steel output rose 18 pct in the first quarter and business, 33 pct.

Production may increase but Italian steel men are depressed because they still must operate be-

SPIDER: Giant rotor spider, 29 ft in diam, dwarfs operator at GE's Large Motor and Generator Div. at Schenectady. Rotor is shown mounted on boring mill.



low normal standards of efficiency. Finsider is now on a reconstruction program to build and modernize.

U. S. assistance has helped. A substantial part of the new equipment scheduled to come from the U. S. is already in Italy. A sore spot with Italian mills has been crude machinery for flat-rolled. Rolling equipment has been assigned from the U. S.

Armour Opens Corrosion Lab

Chicago—The new corrosion laboratory recently opened at the Armour Research Foundation of the Illinois Institute of Technology will help scientists find newer, less-expensive ways to combat corrosion.

Special humidity cabinets and salt spray units will be used to study corrosion inhibitors.

Development of new and improved corrosion inhibitors could slash the nation's annual \$5.5 billion corrosion bill, according to Dr. Edward Schwoegler, who will supervise the project.

Carriers to Haul Liberian Ore

New York—Four 24,000-deadweight-ton iron ore vessels are being built at Fairfield Shipbuilding & Engineering Co., Glasgow, Scotland, to carry Liberian ore to the new ore pier at Baltimore for Republic Steel Corp. The ships will be 639 ft long and have a beam of 30 ft.

Each carrier will be able to haul 250,000 tons of ore per year. The Glasgow firm will deliver the first in November. Delivery will be completed in 1953.

April Car Sales Decline

Detroit—Factory sales of motor vehicles during April dropped 115,709 units below the March total, according to statistics compiled by the Automobile Manufacturers Assn.

Including vehicles for the Armed services, April sales totaled 639,313 units of all types. Passenger car total was 503,079. Factory sales for the first 4 months of 1951 aggregated 2,619,489 units.

Farm Equipment Market to Continue Strong

Good business for rest of '51 indicated . . . Some notice spring sales slow up a month earlier . . . Mechanization trend, need for more crops will keep business high — By Gene Beaudet.

Chicago — Those plumbing the farm equipment market for signs of softness are coming up with readings that indicate high levels of business for the rest of the year. Most manufacturers will be able to sell all they can produce. This may require more selling effort in some lines but on the whole the situation is sound.

Mechanization Trend

However, some companies have noticed that the upward trend of spring sales started to decelerate about a month earlier this year. Others reported a drop in cash receipts from dealers at the same time. But for the most part spring sales have lived up to expectations. Several large producers in the area report sales for the last 6 months are running about 30 pct ahead of the same period last year.

Some feel the high production of the last 3 years might cause the demand for farm equipment to level off later in the year. However, since 1941 there has been an ever increasing trend toward further farm mechanization. From that time the number of tractors on farms has increased from 1.7 million to 4 million units.

Mechanical corn pickers have risen from 120,000 to over 400,000

during the same interval. Grain combines now total 700,000 as compared with 225,000 before Pearl Harbor. Production of sprayers and dusters increased ten times.

There are several factors working against any softening of the farm equipment market for the remainder of this year. The government has requested farmers to increase acreages of corn, cotton, wheat and other crops to exceed last year's goals. The cotton crop goal is said to be set at 16 million bales. Along with this, the Bureau of Agricultural Economics estimates that farm income during 1951 will reach \$17.8 billion.

This represents an increase of 25 pct over last year and closely approximates the all time high set in 1947. When farmers have money and the possibility of making more, through the use of new equipment, they buy farm machinery.

The trend of labor is still away from the farms either to industrial areas or military service. So there is still a need for labor saving equipment. Another factor contributing to a healthy market is that in 1950 farm machinery discards averaged considerably more than they did in recent years.

While sales remain good there is no great evidence of a scarcity.

DAILY GRIND: Day by day this big Baldwin hydraulic press turns out "green" grinding wheels at plant of Simonds Abrasive Co. Press has 43 in. diam ram.



At the present time government sources indicate the situation is one of fairly good supply. Farmers have and are able to obtain sufficient numbers of tractors, combines, corn pickers, sugar beet harvesters and other standard types of equipment.

Demand for newer types of farm equipment, such as cotton pickers, may run ahead of demand but this is the only tight spot according to Agriculture Dept. officials.

The government is not particularly concerned about a shortage of farm equipment needed to boost

its food and fibre production goals this year. Dept. of Agriculture officials claim that production so far this year has met the requested levels which were set to equal 1949's.

Farm equipment shipped last year came to \$1,800 million. With steel allocations for the industry set for the rest of the year under DO orders or CMP allocations, the goal is pretty well assured. Materials for production of repair parts to enable the industry to produce 105 pct of the amount made in 1949 are said to be awaiting approval.

increased production allowances and may press for industry-wide or territorial blanket coverage of pension plans. Labor is not expected to press for the closed shop.

Charles L. Wheeler, president of Salt Lake Hardware Co., inveighed against a government created shortage hysteria. Quoting steel and aluminum capacity figures from THE IRON AGE, Mr. Wheeler told members of the National Supply & Machy. Distributors Assn. there appears to be plenty of steel for military and domestic needs if equitably distributed.

Franz T. Stone, retiring president of the American Supply and Machy. Mfrs. Assn., and director of NPA's Industrial and Agricultural Equipment Bureau, assured the conventionites most materials controls can probably be lifted by 1953 short of all-out war.

New officers elected were:

American Supply & Machy. Mfrs. Assn., Inc.: President, Ralph M. Johnson; 1st vice-president, J. A. Proven; 2nd vice-president, T. D. Vandervoort; treasurer, J. Robert Kelley.
National Supply & Machy. Distributors' Assn.: President, W. A. Haseltine; area vice-presidents, Harold E. Torell, T. G. Vaughan, J. D. Nicholson.
Southern Supply & Machy. Distributors' Assn., Inc.: President, Walker L. Wellford, Jr.; 1st vice-president, Ben S. Barker; 2nd vice-president, L. F. Perkins.

Suppliers Discuss Controls—See Some Hope

Machinery manufacturers and distributors in San Francisco convention find demand leveling off . . . Many anticipate end of sellers' market in 1952.—By Robert T. Reinhardt.

San Francisco — Government controls, pros and cons, were thoroughly hashed over in a big 3-day, triple industrial supply convention jamboree staged for 1600 members here last week.

Short of all-out war, manufacturers can look for a breathing spell in 1952, according to manufacturers and distributors of some \$3 billion worth of industrial tools and equipment each year.

Members of the American Supply & Machy. Mfrs. Assn., National Supply & Machy. Distributors Assn., and Southern Supply & Machy. Distributors Assn. talked shop for 3 days. They heard the views of speakers in and out of the trade.

At an all-day affair top execs of 200 manufacturers were hosts to members of two distributing organizations. It was a "meet the brass and talk it over" meeting and both groups had a chance to air beefs and iron out supply-demand problems.

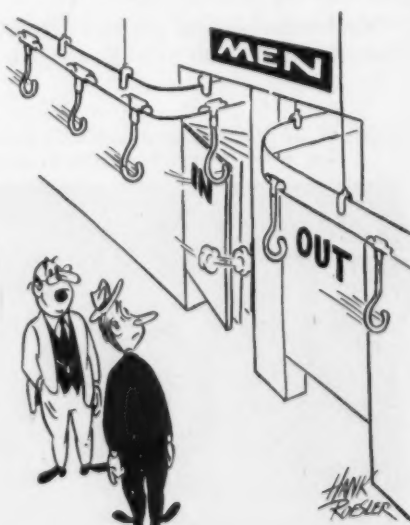
Wage and price controls as a means of slowing inflation were favored by Almon E. Roth, president of the San Francisco Employers' Council. Experience in the past 10 years has shown the need

and value of controls to minimize inflation, he said.

Stiffer indirect controls such as increased taxes, credit restrictions, and material allocations for civilian goods can be expected, Mr. Roth said.

The basic wage increase limitation formula will be geared to the cost of living. Pensions and welfare insurance allowances may be excluded from limitations the Board fixes on wage increases.

Labor will probably drive for



"It's cut our down-time approximately 8 1/2 minutes."

Industry Panel Analyzes State Of Steel, Nonferrous, Light Metal

New York—A panel of men in industry got their heads together recently under the auspices of the National Industrial Conference Board. By weighing current shortages of some metals and chemicals, they tried for a squint into the future.

James Boyd, Administrator, Defense Minerals Administration, said the U.S. had lost its position as an exporting nation of large tonnage items, particularly non-ferrous metals. On the tight alloying situation, he said the "substitutability of molybdenum for nickel and tungsten is somewhat doubtful, and will give us great difficulty."

Earl M. Richards, Republic Steel Corp., thought steel needs of the defense program should take less than one-half as much steel per

gear as was used in World War II. Simon D. Strauss, American Smelting & Refining Co., said the U. S. is gradually depleting its supply of ore and the nonferrous industry has reached its peak if not beyond it. He estimated that imports of refined copper in 1951 will drop to about 250,000 tons.

On light metals, Richard J. Lund, Battelle Memorial Institute, said that by 1953 the U. S. may have capacity to produce 1,090,000 tons of primary aluminum economically and 80,000 tons by uneconomical methods. He saw more and more magnesium going into aircraft.

American Interest Swings to Overseas Tools

European machine tool builders at Canadian International Fair say sales to U. S. expand . . . Shorter delivery time more of factor than lower prices—By Fred Sanderson.

Toronto—Long deliveries on American machine tools and determination of foreign governments to sell in the dollar area are resulting in an expanding market for foreign machine tools on this side of the Atlantic. While most sales are being made to Canadian industry, British, French, Swiss and German machine tool builders report that sales in the U. S. are increasing from a trickle to a stream. Canadian sales to the U. S. are also on the upswing.

Expect Another Rise

Interest is spread over a variety of tools. Normally, the small American market for foreign tools is mostly limited to a few specialties and to rock-bottom-priced equipment sold to manufacturers who don't need the extra quality of American machine tools. But now, all types of machines are in demand, with great interest being shown in such equipment as automatic lathes, large boring and milling machines, and radial drills.

Orders booked by British machine tool builders at the 1949 Canadian International Trade Fair totaled only \$1.3 million. Orders taken at the 1950 Fair tripled to \$4.2 million. Sales to Canadian and American buyers at the 1951 Fair, held in Toronto May 28 to June 8, will show another substantial increase. Sales by other nations followed the same course.

Sales at the 1951 Fair were so heavy that in many cases they caused increases in quoted delivery time. But overall delivery times are still considerably less than for comparable U. S. machines. A French firm will deliver automatic lathes in about 12 weeks, plus ocean shipping time. Other French sales are being made for delivery in 3 to 6 months. Delivery time being quoted on most Swiss and German machine tools is 3 to 4 months. British delivery times, 8 to 12 months, are still somewhat below deliveries quoted for equivalent U. S. and Canadian machine tools.

Quicker delivery spurs American purchases more than lower prices. Canadian prices at the Fair were generally a shade below American. Some French prices rivalled those of U. S. builders. Others hovered nearer the Canadian level—such as German and Swiss. British prices were generally the lowest although many of them were edged closer to the Canadian level recently.

Civilian needs and arms programs make the supply situation in England tight, curtailing exports. In trying to meet demands from nations other than Canada and the U. S., Britain's supply for this continent has been restricted. But the need for hard currency assures that England will make the maximum effort to sell to Canada and the U. S. as many tools as can be spared.

BITS AND BRIEFS

By Bill Packard

Don't let present price softness fool you. Inflationary pressures still building. Question is will they seep through cracked control lid, or will they blast it . . . Following successful pilot operation, Dow Chemical will build plant for commercial output of vinyltoluene—a substitute for styrene in manufacture of synthetic rubber plastics and coatings. This should take some pressure off benzene demand . . . Western Electric to produce electronic ordnance items in government owned plant at Fullerton & Normandy Ave., Chicago . . . Some people in industry still not convinced defense program is for keeps. They don't understand this operating at full throttle with the brakes on . . . Buick to build Wright J-65 Sapphire jet engines in three new plants, two at Flint, Mich., and one at Chicago . . . People still haven't spent themselves out. Loaded counters have made them coy, but sugar-coated bargains still cause a stampede. Ask Macys or Gimbels . . . Fred M. Keller, president and general manager of Middleville Engineering & Mfg. Corp., Middleville, Mich., forming Associated Sales and Mfg. Co. to make magnesium products by die casting process for aircraft industry . . . If you use sulfur or sulfuric acid you may have supply trouble in the months ahead. Output is inching up and there'll be enough for essential uses—but not enough to satisfy all customers . . . Ingersoll Products Div. Borg-Warner starting construction of plant addition in Chicago. Defense contract for larger caliber steel cartridge cases made expansion necessary . . . Machine tool builders ready to sublet a lot of contracts as soon as they get official word of revision of pricing regulation . . . Air transport of vital alloying elements from remote places too costly to be practical now. But don't rule it out if war clouds blacken.

CMP May Cover All Production by Year End

Consumer durables producers will be asked to file fourth quarter requirements . . . Want information for possible change to all-out CMP . . . Reporting forms ready by July 1.

Washington — Virtually all production, defense and civilian, may be under CMP by the end of this year. Only mill lead-time precludes an earlier date.

First official confirmation that open-end CMP is a dead issue, even before the program starts, came from NPA Chief Manly Fleischmann. Supporting a contention of THE IRON AGE that open-end CMP would not work, Mr. Fleischmann revealed producers of consumer durables will shortly be asked to file fourth quarter requirements for CMP materials.

"No decision has been made whether to process this CMP paper," Mr. Fleischmann said. But NPA would have the information "if necessary" to make the transition to all-out CMP.

Best evidence of an all-out CMP lies in the announcement NPA will allocate CMP materials to "all producers of essential defense-supporting and civilian products who have filed under CMP regulations."

Allocations to Take 90 Pct.

Production of finished steel for the third quarter is estimated by NPA at about 20.2 million tons. Allocations now planned would take about 90 pct for all controlled distribution, leaving a possible 2 million tons for the free area.

NPA was preparing to mail out allotments under the broadened base this week. The agency estimated most industries could begin obtaining materials under the allotments out of September production.

The agency also is planning to begin distributing the reporting forms to consumer durables goods manufacturers not later than July 1. The tentative cut-off date for returns is Aug. 1.

Based on present CMP operations, non-covered industries now operating in the free area could be included within CMP and given allotments in time to obtain some materials out of December production. They would then be under full CMP by Jan. 1.

Unspecified Amounts

Steel, aluminum, and copper producers will be ordered to reserve as yet unspecified amounts to fill orders from producers in the free areas.

During the third quarter change-over from the current DO priority system to CMP operations, CMP preference-rated orders will take precedence over other DO priorities. Some CMP rated orders, mostly from the military, have begun showing up.

Steel Pricing Case Called Off by Federal Trade Commission

Washington—FTC has called off its 4-year old pricing case against American Iron & Steel Institute and 90 steel producers. The government had charged collusion in the determination of delivered prices.

Under terms of the settlement, agreed to by the industry and government, defendants do not admit to the charges, but agree to refrain from such practices in the future.

Announcement of the settlement on June 19 came in the form of a "tentative decision" of the FTC. The decision becomes final in 30 days, unless appeal is made by an outside party.

Industry attorneys see added significance in the decision in a statement by the commission regarding delivered pricing. For the first time, FTC made clear its position on the legality of freight absorption:

"The Federal Trade Commission

is not acting to prohibit or interfere with delivered pricing or freight absorption as such when innocently and independently pursued, regularly or otherwise, with the result of promoting competition."

Freight Car Builders Told July Steel Will Not Meet Needs

Washington—No early relief is in sight for NPA's freight car headaches. The agency told the industry last week there is not likely to be enough steel available to meet planned July requirements.

Present programming by NPA calls for about 9200 cars a month, against the original program of 10,000. But car builders are gloomy. Steel mills, they say, have accepted only half of July allotment orders and have been taking little or no August orders for structurals and plate.

NPA has promised priorities assistance in obtaining materials for August and September. Unless the agency does, the builders say, the result would be lay-offs up to 50 pct and a virtual stoppage of tank car output.

In the meantime, NPA is studying a quarterly schedule for freight car production. Parts makers complain that under the present allocation system they must estimate requirements on the basis of orders on hand.

Industry Controls This Week:

NPA Orders

Dir. 1, M-1, CMP order date—Effective date for CMP orders postponed to July 7.

M-70, General marine — Permits purchase of MRD supplies for stock at 120 pct of fourth quarter 1950 rate. Foreign ships in domestic ports are included. Pleasure craft and purchase of fuel are not covered. Effective June 19, 1951.

CMP-1, Dir. 1 — Manufacturers using small quantities of steel, copper, and aluminum for Class B products may use SU symbol on orders for these materials without application to NPA. Effective June 8, 1951.

CMP-1, Dir. 2—Producers of controlled materials may use DO-PM

ratings in obtaining materials other than aluminum, copper and steel. Effective June 8, 1951.

DMA Orders

MO-8, Molybdenum concentrates—Delivery and receipt of concentrates must be approved by Defense Minerals Administration. June 8.

DEFENSE CONTRACTS

Week of June 18, 1951

Driftmeter parts—Bendix Aviation Corp., Teterboro, N. J.
Engine mounts—The M. B. Mfg. Co., Inc., New Haven, Conn.
Aircraft parts—Minneapolis-Honeywell Regulator Co., Minneapolis
Engine analyzers—Sperry Gyroscope Co., Great Neck, N. Y.
Tubes—Westinghouse Electric Co., Dayton
Turbochargers parts—General Electric Co., Schenectady
Ball bearings—New Departure Div., GMC, Bristol, Conn.
Ball bearings—The Barden Corp., Danbury, Conn.
Water supply kits—Yardley Industries, Columbus, Ohio
Regulators—General Electric Co., Dayton
Jack assemblies—The General Tire & Rubber Co., Akron, Ohio
Vehicle spare parts—United Motors Service Div., GMC, Detroit
Trailer assemblies—Bendix Westinghouse Automotive Air Brake Co., Elyria, Ohio
Cylinder assemblies—Pressed Steel Tank Co., Milwaukee
Clocks—General Electric Co., Bridgeport, Conn.
Duplicating machines—Addressograph-Multi-graph Corp., Dayton
Fire detection kits—Thomas A. Edison, Inc., West Orange, N. J.
Trailer parts—Standard Steel Works, North Kansas City, Mo.
Compressor spare parts—Champion Pneumatic Mach. Co., Princeton, Ill.
Tank—Littleford Bros., Inc., Cincinnati
Spare parts—Rogers Bros. Corp., Albion, Pa.
Spare parts—Linde Air Products Co., New York
Spare parts—The Jeffrey Mfg. Co., Columbus, Ohio
Spare parts—Electric Auto Lite Co., Toledo
Spare parts—Bucyrus Erie Co., Milwaukee
Spare parts—Ohio Auto Parts Co., Columbus, Ohio

NPA Increases Bar Allotments

Washington—Steel mills have been directed by NPA to increase allotments of cold-finished carbon steel bars to converters from 90 to 100 pct of base period shipments, beginning with August production.

Also, NPA is instructing producers to increase order board reserves from the August roll for the following carbon steel products to meet rated orders, DO's and CMP:

Hot-rolled carbon bars, from 55 to 65 pct; reinforcing bars, from 55 to 65 pct, and cold-finished carbon bars, from 50 to 55 pct.

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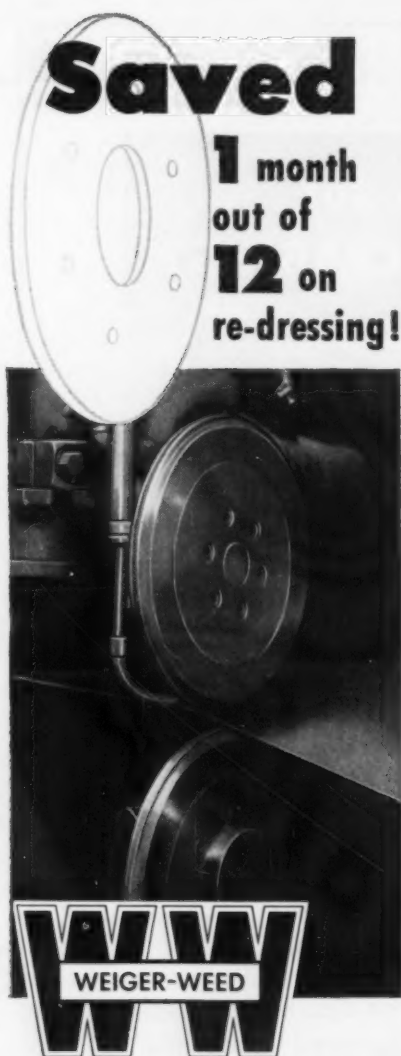
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Actual year's closely kept record: In one of the largest tube mills: WW Seam Welding Wheels required dressing only once in every three weeks.

Wheels formerly used, had to be redressed every week, taking 6 man-hours. Total for year, 312 man-hours.

In the same period Weiger-Weed wheels required only 104 man-hours for re-dressing. A saving of 208 man-hours, or a full month!

This does not mean that the previous wheels were inferior in quality. Wheels of this type alloy are satisfactory on many tube mill applications. WW application engineers saw that this particular installation was different and recommended the correct WW alloy. This same service is available to you. Weiger Weed & Company, Division of Fansteel Metallurgical Corporation, 11644 Cloverdale Avenue, Detroit, Michigan.



Send for this free book of latest information on resistance welding.



Controls Digest

Third Quarter Alloy Steel Reserves for CMP Orders Boosted

Use new base for figuring reserves . . . Plan on 1.8 million ton output.

Washington — NPA last week told alloy steel producers to increase reserves of third quarter production for CMP rated orders.

Reserve percentages will be based on planned third quarter production rather than average shipments for first 8 months of 1950. This change in figuring reserves is expected to improve balance of supply and demand.

Permitted uses will be related to planned production, and NPA feels reserves should be placed on a similar basis.

Reserve percentages announced for the third quarter are based on an estimated production of 1.8 million tons of alloy steels—a big increase over first quarter and estimated second quarter output.

Following are third quarter order board reserve percentages by various types of alloy steel:

PRODUCT	RESERVE PCT
Ingots	50
Billets, projectile and shell quality	By Negotiation
Blooms, slabs, billets	65
Sheet bars	5
Tube rounds	85
Wire rods	25
Plates, universal mill	75
Plates, strip mill	75
Bars, projectile and shell quality, 3 in. and over, round or square	By Directive
Bars, hot rolled, including projectile and shell quality under 3 in., round or square	75
Bars, cold finished	60
Oil country goods, seamless	100
Mechanical tubing, seamless	85
Pressure tubing, seamless	85
Wire, drawn	25
Sheets, hot rolled	60
Sheets, cold rolled	60
Strip, hot rolled	40
Forgings	50

Must Submit Inventory Report

Washington—Oil and gas operators applying for priorities assistance (Forms PAD-15 or 17) for fourth quarter casing and tubing must also submit an inventory and program report (Form PAD-16).

This requirement was overlooked by NPA in issuing M-46 but will be included in a forthcoming order, M-46C. June 30 is the deadline for fourth quarter applications.

Continued

Hazelton Refused

Washington—Refusal of DPA to grant Hazelton Steel and Tubing Corp. \$7.8 million worth of tax amortization can be chalked up as a political victory for the House Expenditures Committee.

At one point, DPA was ready to approve the firm's application. But top production officials scorched a few DPA telephone lines and told the agency to go dry itself behind its political ears.

Defense Order for Trailmobile

Cincinnati — The Trailmobile Co., this city, has added a \$4,500,000 contract for 2000 military ordnance vans and platform trailers to its backlog of defense orders. Primary production engineering will be preformed by Trailmobile on the 6-ton, single axle cargo trailer chassis. This may become standard for all units of the armed services.

After production has started on the trailers, Trailmobile will turn over to Ordnance Corps the basic drawings and engineering data. Bodies will be bolted instead of welded, permitting different types of bodies to be interchangeably installed on the standard chassis.

Reschedule Orders for Aircraft

Washington—NPA has given the Defense Dept. authority to reschedule delivery on rated orders of all materials involved in support of the aircraft program, according to need. Previously, only aluminum, magnesium, and instrument bearings could be rescheduled.

Named to Copper Division

Washington—Joseph W. Lullally of Anaconda Wire & Cable Co. has been named deputy director of NPA's copper division. He will assist acting director Frank Hayes in handling copper responsibilities under CMP.

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Give Okay to 109 New Fast Tax Write-Offs; Total Now 1766

Washington—The Defense Production Administration approved 109 certificates of necessity for fast tax write-offs from June 1 to June 8.

As of June 8, 1766 certificates of necessity had been issued. Aggregate amount of total proposed investment certified as eligible for 5-year amortization now stands at \$6,158,385,156.

Certificates included in the latest DPA report, listed by company, use, amount applied for, amount eligible, and per cent approved, are:

Henry Bros. Tool & Die Works, aluminum adapters, \$6,216, \$6,216, 90.
Frisby Machine Co., Inc., aircraft, \$59,475, \$59,475, 80.
Hackensack Cable Corp., wire rope, \$264,223, \$264,223, 75.
National Electrical Machine Shops, instruments, \$158,364, \$158,364, 80.
The Imperial Brass Mfg. Co., forgings, \$56,198, \$56,198, 75.
Chrysler Corp., testing, \$1,450, \$1,450, 75.
Farr Co., air filters, \$392,315, \$197,575, 75.
Conemaugh & Black Lick RR. Co., transportation, \$2,328,000, \$1,443,000, 65; \$85,000, 50.
Paramount Rubber Co., rubber parts, \$100,000, \$100,000, 75.
Turner Piston Co., permanent mold castings, \$26,725, \$26,725, 75.
Packard Motor Car Co., turbo jet engines, \$15,315,493, \$15,244,800, 75.
The Clark-Aiken Co., parts for machine tools, \$83,500, \$83,500, 90.
El Paso Associates, plungers for fuse, \$30,000, \$30,000, 75.
Harrison Oil Burner Corp., porcelainizing of mufflers, \$13,321, \$13,321, 75.
General Metals Corp., clips-line supports blocks, \$5,624, \$5,624, 75.
Hanna Furnace Corp., pig iron, \$12,000,000, \$12,000,000, 85.
Auburn Spark Plug Co., Inc., screw machine parts, \$49,807, \$49,807, 90.
Anderson, Inc., wheels-brakes for aircraft, \$17,987, \$17,987, 90.
Aveco Mfg. Corp., engines for tanks, \$286,430, \$286,430, 75.
The Nashville, Chattanooga & St. Louis Ry., transportation, \$6,263,211, \$6,263,211, 65.
The Oilgear Co., ordnance, \$159,630, \$159,630, 80; hydraulic pumps, \$1,100,363, \$1,100,363, 80.
Acme Electric Corp., aircraft, \$167,427, \$165,427, 75.
The Cleveland Hobbing Machine Co., machine tools, \$90,798, \$58,559, 85.
Sundstrand Machine Tool Co., machine tools, \$45,872, \$45,872, 75.
Chicago Forging & Mfg. Co., aircraft, \$130,232, \$130,232, 85.
The American Steel & Wire Co. of N. J., wire products: \$66,581, \$66,581, 60; wire, \$351,706, \$351,706, 60.
Wm. R. Whittaker Co., Ltd., hydraulic valves, \$112,642, \$112,642, 85.
General Steel Castings Corp., cast armor for tanks, \$698,995, \$698,995, 75.
New Hampshire Ball Bearings, Inc., ball bearings, \$522,760, \$520,760, 80.
Houston Oxygen Co., oxygen, acetylene, \$903,100, \$903,100, 65.
Whitehead Bros. Rubber Co., hose, \$219,392, \$180,492, 75.
Crawford Fitting Co., vacuum fittings, \$42,040, \$42,040, 90.
Raybestos-Manhattan, Inc., tank clutch plates, \$1,816,512, \$1,757,676, 70.
Union Carbide & Carbon Corp., liquid oxygen, \$7,964,580, \$7,964,580, 55.
Atlantic Coast Line RR. Co., transportation, \$77,100, \$77,100, 65.
Atlantic Coast Line RR. Co., transportation, \$265,318, \$265,318, 65.
Avildsen Tools & Machines, Inc., twist drills, \$291,000, \$291,000, 85.

American Steel & Wire Co. of N. J., wire, \$530,832, \$530,832, 60.
Babcock & Wilcox Tube Co., alloy mechanical tubing, \$660,000, \$660,000, 75.
Bottoms-Fiske Truck Lines, Inc., transportation, \$193,952, \$187,290, 70.
American Drill Bushing Co., Inc., jig bushings, \$56,292, \$56,292, 80.
B & M Towing Co., transportation, \$1,654,000, \$550,000, 80; \$500,000, 70.
Commercial Petroleum & Transport Co., transportation, \$137,520, \$137,520, 80.
Acromatic Tool Co., carbide cutting tools, \$52,338, \$52,338, 90.
Central Barge Co., transportation, \$2,682,000, \$1,662,000, 80; \$1,030,000, 70.
Pyle-National Co., parts for steam power, \$732,060, \$709,050, 80.
Gould-National Batteries, Inc., storage batteries, \$2,982,626, \$2,962,626, 75.
Titan Metal Mfg. Co., bronze bed and wire, \$1,049,707, \$720,106, 60.
John I. Hay Co., transportation, \$440,000, \$440,000, 80.
Wisconsin Central RR. Co., transportation, \$2,204,040, \$863,840, 80; \$1,340,200, 65.
Central West Refrigerator Despatch, transportation, \$1,900,000, \$1,900,000, 80.
The Budd Co., turrets for tanks, \$5,406,000, \$5,300,000, 75.
Louisville & Nashville RR. Co., transportation, \$2,175,512, \$2,175,512, 65.
Long Island Machine & Pattern Works, power supply assemblies, \$26,686, \$26,686, 90.
New Orleans & Northwestern RR. Co., transportation, \$7,195, \$7,195, 65.
Hammond Iron Works, steel plate fabricating, \$519,404, \$519,404, 60.
Elgin National Watch Co., aircraft parts, \$60,812, \$60,812, 75.
Central of Georgia RR. Co., transportation, \$4,362,667, \$4,362,667, 65.
Standard-Thomson Corp., metallic bellows, \$30,000, \$30,000, 75.
American Steel & Wire Co. of N. J., rods, wire, \$257,798, \$257,798, 60.
Virginia Bridge Co., bridge, frames, panels & plates, \$18,838, \$18,838, 60.
Burdett Oxygen Co., oxygen, \$331,185, \$297,685, 55.
Heater Steel Corp., steel plate, steel ingots, \$531,250, \$471,250, 65.
Paul Lime Plant, lime, \$45,000, \$45,000, 75.
Driver-Harris Co., wire and strip, \$759,951, \$759,951, 70.
William F. Klemp Co., structural steel, \$232,058, \$215,040, 60.
Steel Products Engr. Co., antenna system, \$1,714,052, \$1,714,052, 75.
Willard Machine Co., machine tools, \$57,183, \$28,809, 90.
Foote Bros. Gear & Machine Corp., aircraft, \$15,795, \$15,795, 85.
Associated Truck Lines, Inc., transportation, \$475,000, \$375,000, 70.
The Alabama Great Southern RR. Co., transportation, \$625,700, \$625,700, 80.
Georgia Southern & Florida RR. Co., transportation, \$274,500, \$274,500, 80.
New Orleans & Northeastern RR. Co., transportation, \$567,300, \$567,300, 80.
Brainard Steel Co., steel strapping, \$2,531,389, \$2,531,389, 60.
Precision Piece Parts, Inc., aircraft assemblies, \$31,670, \$31,670, 90.
Great Northern RR. Co., transportation, \$1,450,000, \$1,450,000, 80.
C. G. Willis, transportation, \$115,026, \$91,959, 80; \$83,067, 70.
Fabrikent Steel Products, Inc., steel ingots, \$961,500, \$949,500, 70.
Georgia Northern RR. Co., transportation, \$80,879, \$80,879, 65.
Union Carbide & Carbon Corp., liquid oxygen, \$4,250,000, \$4,168,000, 65.
McGill Mfg. Co., Inc., roller bearings, \$878,000, \$814,600, 75.
Angus Park Woolen Co., Inc., flannel, \$538,400, (2), 60.
Dixie Carriers, Inc., transportation, \$93,796, \$93,796, 80.
Inland Steel Co., steel ingots, \$29,400,600, \$29,400,600, 75.
Inland Steel Co., transportation, \$3,015,000, \$3,015,000, 80.
Air Reduction Co., Inc., liquid oxygen, nitrogen, \$5,648,582, \$5,531,252, 65.
Hunt Foods, Inc., military food processing, \$675,000, \$675,000, 35.
Crystal Canning Co., military food storage, \$54,000, \$54,000, 40.
Haldon Machine Co., cutting machinery, \$474,596, \$474,596, 60.
Texas Foundries, Inc., iron castings, \$171,778, \$171,778, 75.
Republic Steel Corp., pig iron, steel ingots, \$8,837,700, \$8,837,700, 70.

(1) Subject to revision upon submission of complete Appendix A detail sheets.
(2) Amount remaining after deducting price from sale of replaced items.

Phillips Petroleum Splits Oil Profits in Return for Barium Pipe

New York—It is a precarious time for oil pipe procurement. Phillips Petroleum Co. maneuvered away from this hardship and the black market by making Barium Steel Co. a partner in drilling wildcat oil wells. In return Phillips was guaranteed 21,000 tons of Barium pipe.

Oil companies previously had collected basketfuls of DO orders for line and drill pipe in their haste to produce the 1 million extra bbl per day suggested by Washington. But the DO orders they waved did not mean a thing. Mills insisted that pipe output was shackled to the realities of actual production not to DO pipe dreams.

Now DO's are granted to producers who know exactly where to get the pipe. Oil men locate the pipe first and slap a DO on it later.

Although asked to raise output, the oil industry felt that allocations of steel were about one-third off the beam. Phillips was jammed up with the rest of them.

Queried by THE IRON AGE, both sides seemed satisfied with the arrangements. Phillips wanted the 21,000 tons of pipe and although the odds against a wildcat oil hit are 1 out of 9, the number of wells to be tried gives Barium a chance to make some extra money.

It was indicated that deliveries will run about 7000 tons a month and that Barium would provide the skelp for further processing.

Some oil men say that the black market in pipe is fierce. Under the Barium deal, Phillips eluded it. It can also build up its operations so that if Washington started computing 1952 allocations by 1951 operations, Phillips would rise in industry stature.

Barium revealed that Phillips had agreed to spend at least \$1,250,000 in exploration and development. Barium Steel gets a 50 pct interest in certain wildcat leases, excepting a 40-acre drilling site. Stockholders were assured that the speculation was without financial risk.

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metallic or non-metallic
any size—any quantity
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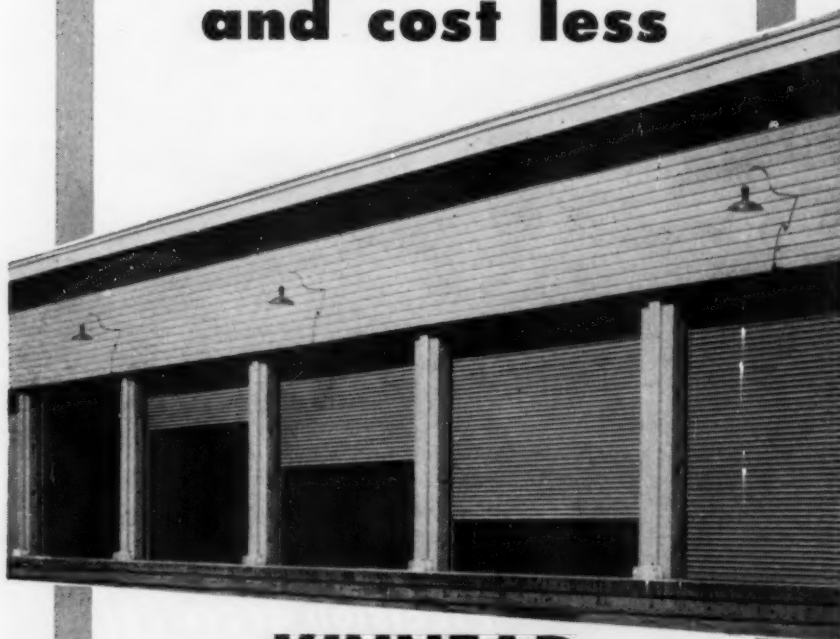
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Helical Gears
Bevel Gears
Ratchets
Worm Gears
Spiral Gears
Spur Gears with
shaved or ground teeth
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with better
doors that
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The easy, upward action of Kinnear Rolling Doors brings time-saving efficiency to any doorway. The strong, all-metal, interlocking slat curtain opens completely out of the way, safe from damage... provides extra safety against fire, wind and intrusion when closed. And they're ruggedly built in every detail, to give extra years of low-cost, low-maintenance service. Any size; motor or manual control. If you haven't a Kinnear catalog for quick reference now, send for your free copy of the latest issue.

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• News of Industry •

New Lighting Installation Used at Austin's Expanded Center

New York—No one at the Austin Co.'s eastern district offices, newly-moved into 600 Fifth Ave., can put his feet on the desk without drawing stares of his fellow workers. The New York layout has no private offices and no partitions except for the reception lobby and two conference rooms.

Areas are subdivided by banks of counter-height steel files. The modern effect of simplicity is lent by Travertine, fluted glass walls, and fluorescent lighting.

Austin's eastern operations center at Roselle, N. J., has been expanded. It now has a total floor space of 20,000 sq ft. Also laid out without partitions, the Roselle offices have the first installation in the East of Austin's new patented Integrated Ceiling-Lighting System.

Previously introduced at The Upjohn Co.'s new pharmaceutical plant in Kalamazoo, the method was designed for economical and simple installation of fluorescent lighting systems in plants and offices. Instead of special framework for lighting fixtures, Austin's new process uses "troffer beams," trough-like structures of heavy gage sheet steel, which serve the double purpose of acting as structural support and raceways for lighting fixtures.

Booklet Explains CMP Records

Washington—How to keep records required under CMP is explained in a booklet issued by NPA under the title "Allotment Accounting for Consumers under CMP." Copies may be obtained from NPA or from Commerce Dept. field offices.

Kennametal Buys Plant Site

Latrobe, Pa.—Kennametal, Inc., has bought a 20-acre tract near Bedford, Pa., where it will build a new plant for its mining tool fabricating division. The new building will permit expansion of facilities here for producing heat-resistant titanium carbide.

Unemployment at New Low

Washington—Unemployment hit a new low in May at an estimated figure of 1.6 million, while civilian employment rose to 61.2 million. Despite cutbacks in manufacture of automobiles and other consumer durables, lay-offs were at a new low postwar level, according to the Bureau of Labor Statistics.

Metalworking and metal products manufacturing are maintaining high hiring rates. Quit-rates are below the wartime level, except in fields where workers are shifting to defense jobs.

PA's Note Price Stability

Chicago—Stabilizing influence of price controls is reflected in the May report of the Purchasing Agents Assn. of Chicago. Some 89 pct of PA's report May prices the same as April.

Delivery of materials to 8 of 10 reporting companies has accelerated. Inventories remain stable. Lower production in May is recorded by only 20 pct.

Pugsley to Discuss Costs

New York—How Tennessee Coal, Iron & R.R. Co. controls manufacturing costs by analysis of variances from standard will be described by John Pugsley, executive vice-president, at the 32nd annual conference of the National Assn. of Cost Accountants. The meeting will be held at the Palmer House, Chicago, June 24 to 27.

Construction Contracts Up

New York—May construction contracts for 37 states east of the Rockies totaled \$2,572,961,000 and were 87 pct over the April figure, according to F. W. Dodge Corp. The May total was 91 pct higher than May 1950. Total for the first 5 months of 1951 was \$7,399,177,000.

Record Peak Sales in '51

Chicago—Sales of International Harvester Co. for the first 6 months of its 1951 fiscal year ending April 30 totaled \$611,304,000, highest in the company's history.



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MULTIGRIP
FLOOR PLATE**

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...under all conditions**

- Designed so that several skid-resisting risers grip the foot at all times, U-S-S Multigrip Floor Plate provides safe, sure footing . . . whether the plate is wet or dry! There are no pockets to hold water . . . drainage is complete in all directions. And because the flat-topped, scientifically-designed risers have sloping sides, it is impossible to catch the toe of a shoe on them.

Vehicles have positive traction on Multigrip, too. There are no gutters to trap narrow wheels. Vehicles roll on the risers, not *between* them.

Get further information about safe, easy-to-clean, *permanent* Multigrip from your nearest steel warehouse or write to us direct.

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Ceramic
STRAINER CORES

Major foundries all over the nation are now using ALSiMag Strainer Cores. They use them because these ceramic cores save them money in time, labor and materials.

ALSiMAG STRAINER CORES

ALSiMag Strainer Cores are flat, kiln-fired ceramic cores, precision made to fit into the gate of a mold. They strain the incoming metal and regulate its flow. Made in many shapes and sizes. Gas free. Do not break up. Tough. Easy to store. Require no change in molding procedure.

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50TH YEAR OF CERAMIC LEADERSHIP

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STEEL

CONSTRUCTION

NEWS

Reinforcing bar awards this week included the following:

- 400 Tons, Chanute Field, Ill., Messa hall and administration Bldg. to Jonathan Woodner Co., Washington, D. C.
- 330 Tons, Rock Island, Ill., St. Anthony's Hospital. Priester Construction Co., Davenport, Ia., low bidder.
- 254 Tons, Boston, substructure and approaches for single and double deck elevated highway structure. C. J. Maney Inc., Somerville, Mass., low bidder, and awarded contract.

Reinforcing bar inquiries this week included the following:

- 1081 Tons, Boston connection, Boston Central Artery, deck electrical work and snow melting system. Completion date is Dec. 31, 1953.
- 550 Tons, Chicago, auxiliary outlet sewers contract 2-A.
- 500 Tons, Chicago, Apt. Bldg., Briar Place. Bids due June 27.
- 140 Tons, Boston, Fens Pond and James J. Storrow Memorial Drive, Charles River Reservation (Back Bay), dredging river bottom, filling and construction of roads, bridges, piers and abutments and two culverts. Completion date Dec. 31, 1951.
- 113 Tons, Lee, Mass., single span half-through steel truss bridge, reinforced concrete approaches on Willow St. over Housatonic River. George A. Curtis, district engineer. Completion date Nov. 22, 1952.

Will Accept Wage Petitions

Washington — Wage Stabilization Board has authorized the Wage & Hour Div. of the Labor Dept. to receive petitions for wage adjustment and to investigate violations.

The new authority extends to 68 field offices maintained by the Wage & Hour Div. Beginning June 25, all Wage & Hour field staffs may examine petitions asking approval of wage adjustments.

TETCO to Build 100 Mile Line

Shreveport, La. — Contract for construction of 100 miles of 30-in. pipe line from Kentucky River to the Ohio River has been awarded by Texas Eastern Transmission Corp. to Mahoney Construction Co. of Lansing, Mich.

Orders Passenger Train Cars

Omaha, Neb. — Union Pacific Railroad has ordered 50 passenger train cars at a cost of over \$6,700,000 from the American Car & Foundry Co. They will be built at the St. Charles, Mo., shops.

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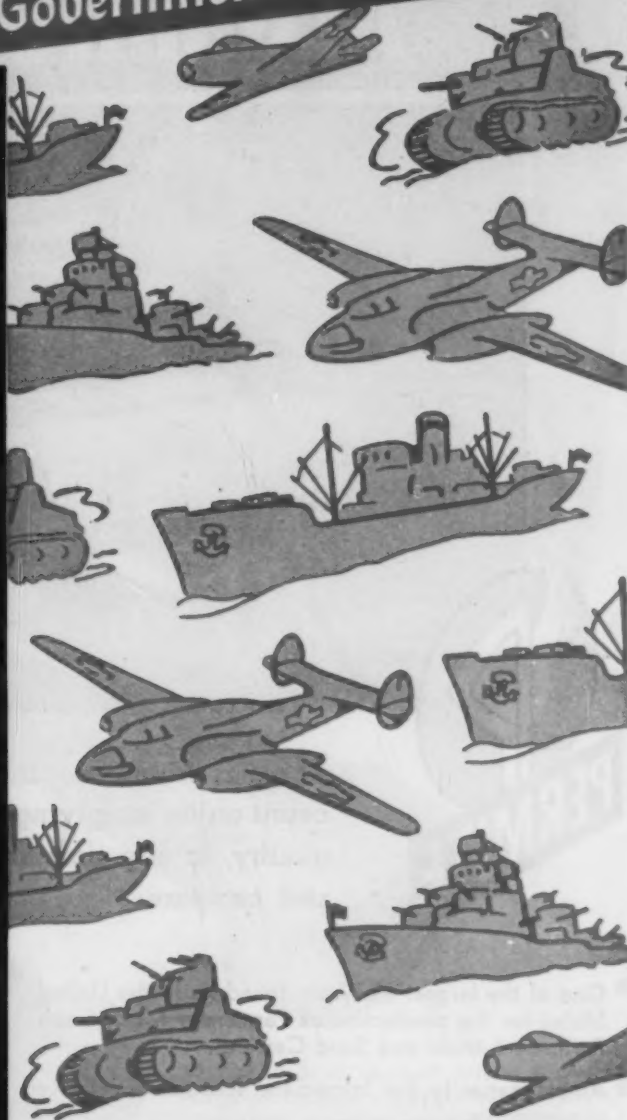
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Completely Integrated Mills!



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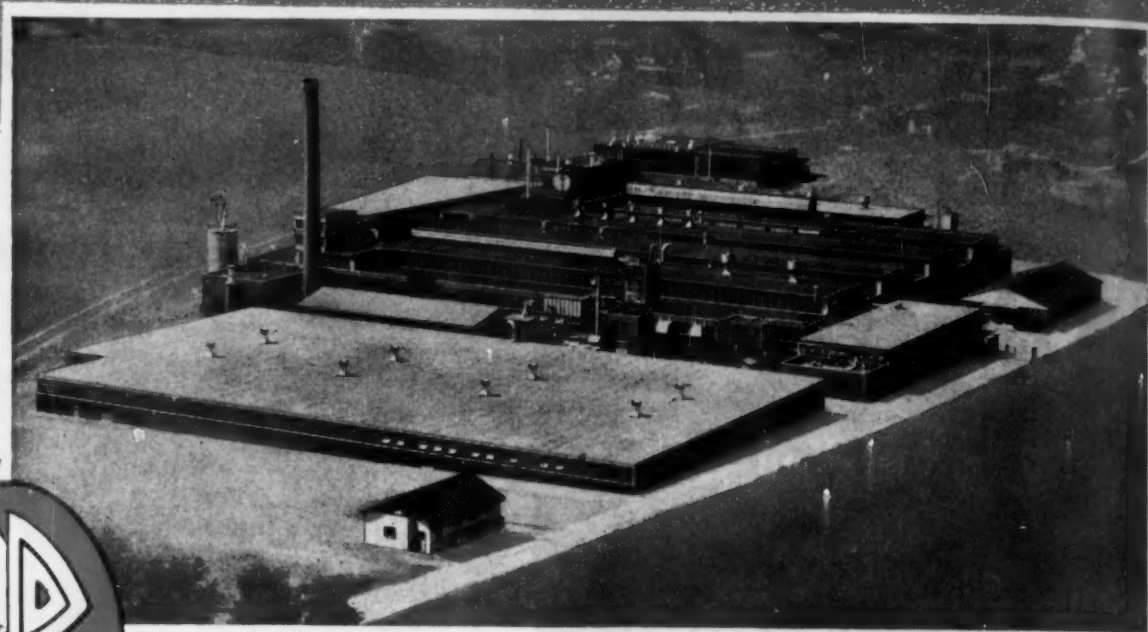


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ALUMINUM PERMANENT MOLD, SAND and DIE CASTINGS...HARDENED, GROUND and FORGED STEEL PARTS

Raising Copper Prices Not Enough, More Steps are Needed

New York—Merely raising copper prices will not correct the ills of the price-distribution picture. What is needed is a "firm grip on copper prices and distribution," activation of more mines, mine improvements, said James T. Duffy, Jr., president of the Riverside Metal Co., Riverside, N. J.

He spoke at the June meeting of the American Steel Warehouse Assn., held here. Mr. Duffy urged that four steps be taken quickly:

- (1) A ceiling price on scrap immediately.
- (2) Increase output of copper ore by U. S. subsidization of marginal high-cost mines.
- (3) Release some copper ore from the stockpile.
- (4) Do not raise prices to pay the 3¢ Chilean differential. Instead give subsidies until "ECA can alert its staff to its costly contribution to the copper price situation."

Fraction of Capacity

He continued that lack of copper and copper scrap is forcing processing plants to operate at a fraction of their capacity. If the metal was sufficiently available they could meet the entire demand. The government stockpiles for the rainy day but now plants are faced with shutdowns because they lack raw materials, he charged.

He noted that "\$350 million worth of copper and its products were recently sent to Europe" under the Marshall Plan. Mr. Duffy asked that restrictions should be imposed on end uses of American copper sent overseas.

Aeroproducts Expands Plant

Dayton — Aeroproducts Div. of General Motors Corp. has signed contracts for a \$2.6 million plant expansion. Plant area will be doubled. The firm will make propellers for the C-119 Fairchild packet and turbo-propellers for the Navy.

Unusually dependable
for strength, accurate fit,
clean-running threads—

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Top Quality

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Cap Screws



• The most all-around satisfactory fastener you can use, with maximum strength, excellent *working* qualities and good appearance. Size and shape are held to remarkably close tolerances. Double heat treating adds the final value to this fine product produced by the Kaufman Double Extrusion Process. It pays you to specify and buy Cleveland High Carbon Heat Treated Cap Screws.

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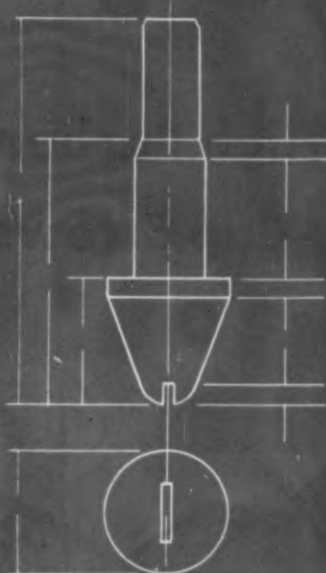
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A **®** IN THE "BONNET"

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Under the hood of your car you'll find this unusual looking **®** special. It does a better job of latching your car-hood than other fastening devices. Simplified design through specialized fastening is today's trend.



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SPECIFICATIONS

Steel, 1015, finish cadmium or zinc plate. Heads to be concentric with barrel to within .015. P.D. of thread to be .4639 — .4675, after plating. Dimensions to suit your most exacting requirements. Quality — **®**.



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Designers who use **®** specials are often able to reduce the parts of an assembly; effect production economies; and give the buyer a better product. That is progress. For this reason the Buffalo Bolt Company maintains a staff for cooperation with customers on special fastener problems.

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• News of Industry •

Railroad Gives Heave-Ho To Clickety-Clack With Long Rails

Installed on Elgin, Joliet & Eastern
... Trains purr on 19,812 ft rails

Joliet, Ill. — First it was the choo-choo, now it's the clickety-clack that's going out of railroads. The Elgin, Joliet & Eastern Ry. has just installed a pair of rails 19,812 ft in length — and trains speed along smoothly without the old familiar sleep-lulling click.

The super-long rails are standard 39-ft lengths, joined by an automatic pressure welding machine. The J, as the Elgin, Joliet and Eastern is known, welds together about 40 of the short standard rails to make 1600-footers.

Hauled out on flat cars the 1600-ft lengths are laid just like regular rail. The long lengths are welded by a hand method to form rails thousands of feet in length. In the big J sections more than 1000 costly-to-maintain rail joints are eliminated.

The J began laying welded rail in 1943 and by the end of 1951 it will have 90 miles of track with continuous rail.

Everyone wonders why the long rails do not present expansion and contraction problems. No magic has been used. Under temperature changes the rails would get longer and shorter if it were not for several factors.

First, continuous rail is laid when the temperature is not too hot or too cold. Second, enormous friction between rail and ties tends to overcome expansion. Third, frictional resistance is increased by spikes.

Finally, anchors hold the rail at particular points to prevent its movement.

French Will Get Corsairs

Washington — An undisclosed number of Navy Corsair fighter-bombers will be built for the French Government under the Mutual Defense Assistance Program, the Navy has announced. The ships will be produced by United Aircraft's Chance-Vought Div. at Dallas, Tex.

(Advertisement)

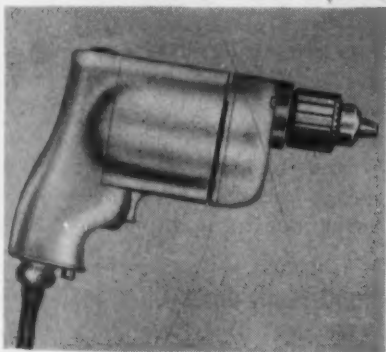
POWDER METALLURGY

PARTS EFFECT OPERATING SAVINGS!

Cost-conscious users of production machinery are becoming increasingly aware of the over-all savings made possible in the operation of machines equipped with "COMPO" and "POWDIRON" bearings and parts. Maintenance expenses are reduced, since in many instances "COMPO" and "POWDIRON" need no re-lubrication during the life of the equipment. When more severe service conditions do require re-oiling, the job is extremely simple—it is only necessary to bring oil into contact with the part. Even this simple attention is required only at infrequent intervals.

OTHER OPERATING SAVINGS

The "COMPO" and "POWDIRON" method of lubrication maintains an oil film on the surface of the bearing or part at all times, thus preventing metal-to-metal contact. This feature reduces wear and prevents scoring of shafts. Bearing replacement is a very rare occurrence, and machine downtime is greatly reduced.



Electric drills equipped with "COMPO" bearings run smoothly and quietly, with minimum maintenance requirements.

HOUSEHOLD AND BUSINESS APPLICATIONS

While the average user of household appliances or business machines is less aware of operating costs than the industrial executive, the long life and simple maintenance of "COMPO" and "POWDIRON" are important selling advantages in these types of products too.

The manufacturer can build these good-will features into his products at surprisingly low cost, since the powder metallurgy process is inherently economical, especially in high-volume runs. Information on "COMPO" and "POWDIRON" for specific applications may be obtained from Bound Brook Oil-Less Bearing Company, Bound Brook, N. J.



Low Operating and Maintenance

Cost IS ONE OF THE 6* OUTSTANDING ADVANTAGES OF

"COMPO" and "POWDIRON"
BEARINGS AND PARTS



*THE 6 OUTSTANDING
ADVANTAGES OF
"COMPO" and
"POWDIRON" are

1. Low operating and maintenance cost
2. Low installation cost
3. High load capacity at high speeds
4. Extreme quietness
5. Efficient lubrication
6. Low unit cost

Constantly maintained oil film keeps both starting and running friction down. Replacements are virtually nil — relubrication is simple, if needed! Incorporate "COMPO" and "POWDIRON" bearings and parts in your product designs — give your customers the cost-saving features they want.

Cut costs *yourself* by using stock "COMPO" bearings wherever possible — write on company letterhead for up-to-minute catalog.

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OIL-LESS BEARING COMPANY

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Get your
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and
COLD SHUTS

FROM

AMERICAN CHAIN



GRAB HOOK



#1 COLD SHUT



S-HOOK



● A complete line of slip and grab hooks, two styles of cold shuts, and S-hooks are made by AMERICAN for use with all types and makes of chain. You can also get from AMERICAN a wide variety of shackles, rings, links, swivels, toggles, and special attachments ...all made by AMERICAN to time-tested specifications.

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AMERICAN has made good chain for a good many years. We've learned how to make good chain better. Make sure you get the best.

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ACCO



AMERICAN CHAIN DIVISION
AMERICAN CHAIN & CABLE

In Business for Your Safety



**Ship Plane Fixtures by Air;
Saves Time in Event of Bombing**

Farmingdale, N. Y. — Tools used to build fighter planes are being shipped, knocked-down, by air in a new experiment. Aim of the experiment, which cuts out slow shipments of heavy welded fixtures, is to reduce production losses in event of a bombing of aircraft factories. First shipment was made this week.

The tools—jigs on which components of the Lockheed F-94 and North American F-86 jet fighters can be constructed—were built by Republic Aviation Corp., with the new optics-castings method developed by Republic for the Air Force (see THE IRON AGE, Dec. 7, 1950, p. 119).

After construction, the jigs were disassembled and loaded on cargo planes headed for the North American and Lockheed factories at Los Angeles. There they will be quickly reassembled and checked by the optical method.

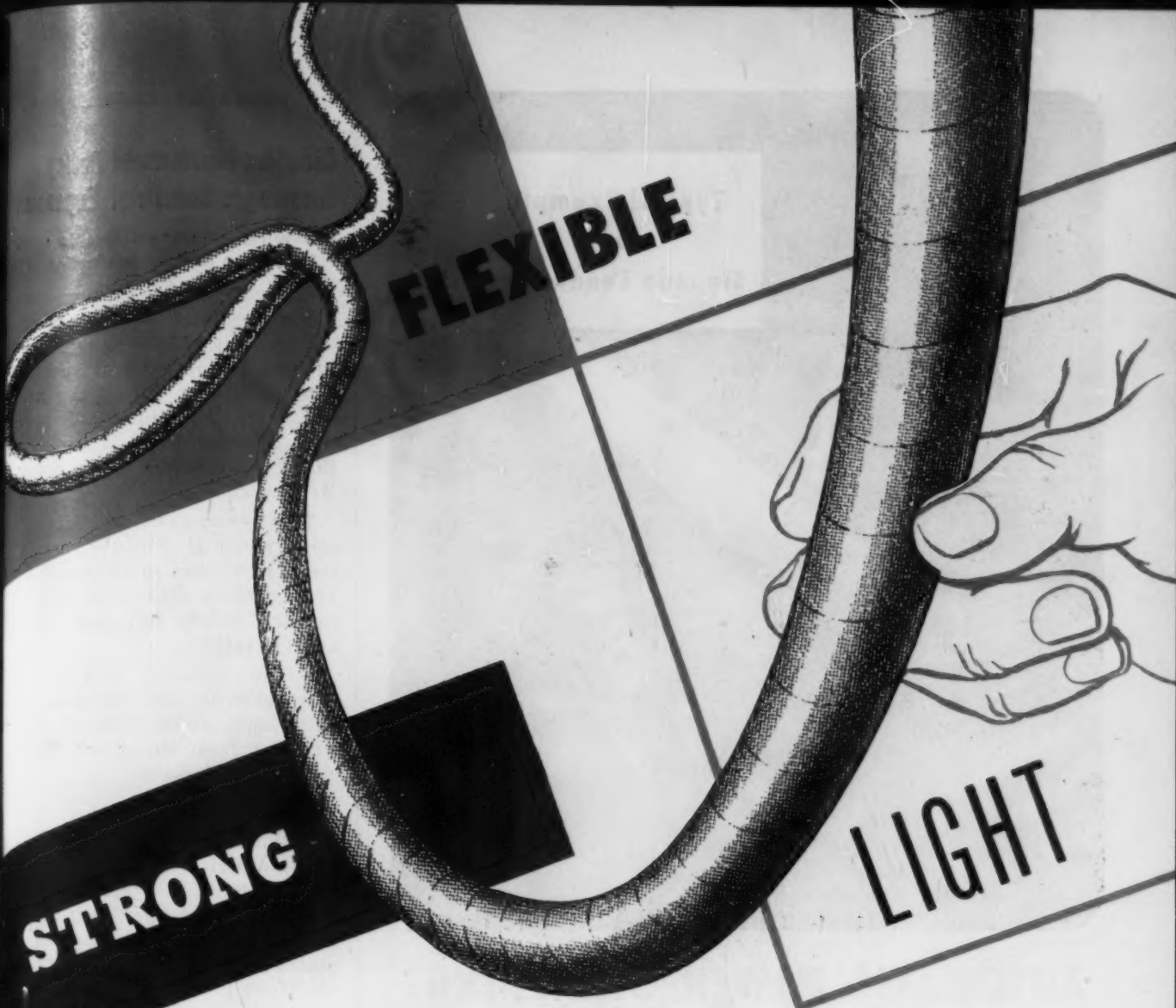
By air shipment of tools made by the optics-castings method, production lost to war damage could be renewed rapidly. Welded fixtures now in use must be transported by much slower surface means because they cannot be disassembled to fit into cargo planes.

Road Maintainer Cuts Costs

Detroit—Dearborn Motors Corp., marketing organization for Ford tractors and Dearborn Farm Equipment, has announced the new "Road Maintainer," designed for low-cost maintenance of unsurfaced roads and road shoulders.

Powered by a Ford tractor, the Maintainer is capable of numerous construction operations, in addition to grading and leveling. An 8-ft blade is operated by a separate hydraulic mechanism, freeing the tractor to operate accessory equipment.

The entire Maintainer equipment attachment can be removed from the tractor and a side mounted mower installed for highway mowing. The equipment is available through Ford tractor dealers.



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STRONG

LIGHT

Condor HOMOFLEX HOSE

"... Everything we want in a hose!" • That's how users sum up the many advantages of Homoflex Hose. • That's why they order more and more Homoflex once they discover it's really a *different* hose . . . easier to coil and uncoil . . . no kinking . . . easier to carry and drag . . . lasts longer in "rough going". • Bulletin 6879D tells why the unique construction of Condor Homoflex makes a better hose for handling air, water, other fluids and gases. • Extra qualities are also engineered into our other hose, V-belts, flat belting and conveyor belts. Just phone your R/M distributor.

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Manufacturers of Mechanical Rubber Products • Rubber Covered Equipment • Radiator Hose • Fan Belts • Brake Linings • Brake Blocks • Clutch Facings • Packings • Asbestos Textiles • Powdered Metal Products • Abrasive and Diamond Wheels • Bowling Balls





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Signode Leadership

AUTOMATIC POWER STRAPPING!

If you have never seen a Signode Power Strapping Machine in action, this may seem hard to believe!

This mechanical device . . . with but the slightest guidance . . . draws steel strapping from a reel, loops it completely around a package or bundle, brings it to just the right tension, and then seals and severs the strap . . . at speeds up to 500 completed operations per hour . . . on such widely varying products as cartons of cigarettes and coils of wire.

Developed to meet the needs of mass production shippers, the Signode Power Strapping Machine, in one or another of its variations, has opened up a whole new avenue of profit possibilities for manufacturers of millwork, flooring, steel, canned food, plastic sheeting, automotive parts and scores of other products. It is one of the more recent, in a long list of contributions, which Signode has made to better packaging and shipping.

If you are engaged in defense or essential civilian production, we'd like to tell you more about Signode steel strapping, strapping tools and methods. Write . . .



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• News of Industry •

Canadian Rearmament Policy Encourages Industrial Expansion

Industry, government plan to spend \$4.5 billion to boost production

Quebec — Canada's rearmament policy is designed to encourage the spending of billions of dollars by both the government and private enterprise during the next few years, according to Production Minister C. D. Howe. Mr. Howe spoke before the Canadian Mfrs. Assn.

The government will directly spend about \$1 billion a year for the next 3 years in building Canada's defense production machine through orders for guns, ships and aircraft.

Private industry, with government priority and financial aid, will spend another \$1.5 billion in wringing from the ground scarce strategic materials.

Generation of Danger

Development of Canada's basic and industrial resources to meet the possibility of a generation of international danger is perhaps even more important than actual placement of defense contracts, Mr. Howe pointed out.

"Only by developing our strategic resources with all speed will Canada be able to bring its full potential to bear in the interests of our defense and that of other democratic countries," he said.

The government has allocated scarce materials to approved expansion projects for copper, nickel, aluminum and base metal smelters to speed development work.

Mid-Atlantic Employment High

New York—Employment in New York, New Jersey and Pennsylvania, an area accounting for approximately 25 pct of the nation's manufacturing jobs, showed a 0.1 pct increase from mid-February to mid-March. Employment in the mid-Atlantic area was up 10.8 pct over March 1950. Total manufacturing employment in the area is 4,233,100, highest figure in 39 months.

PRESSING

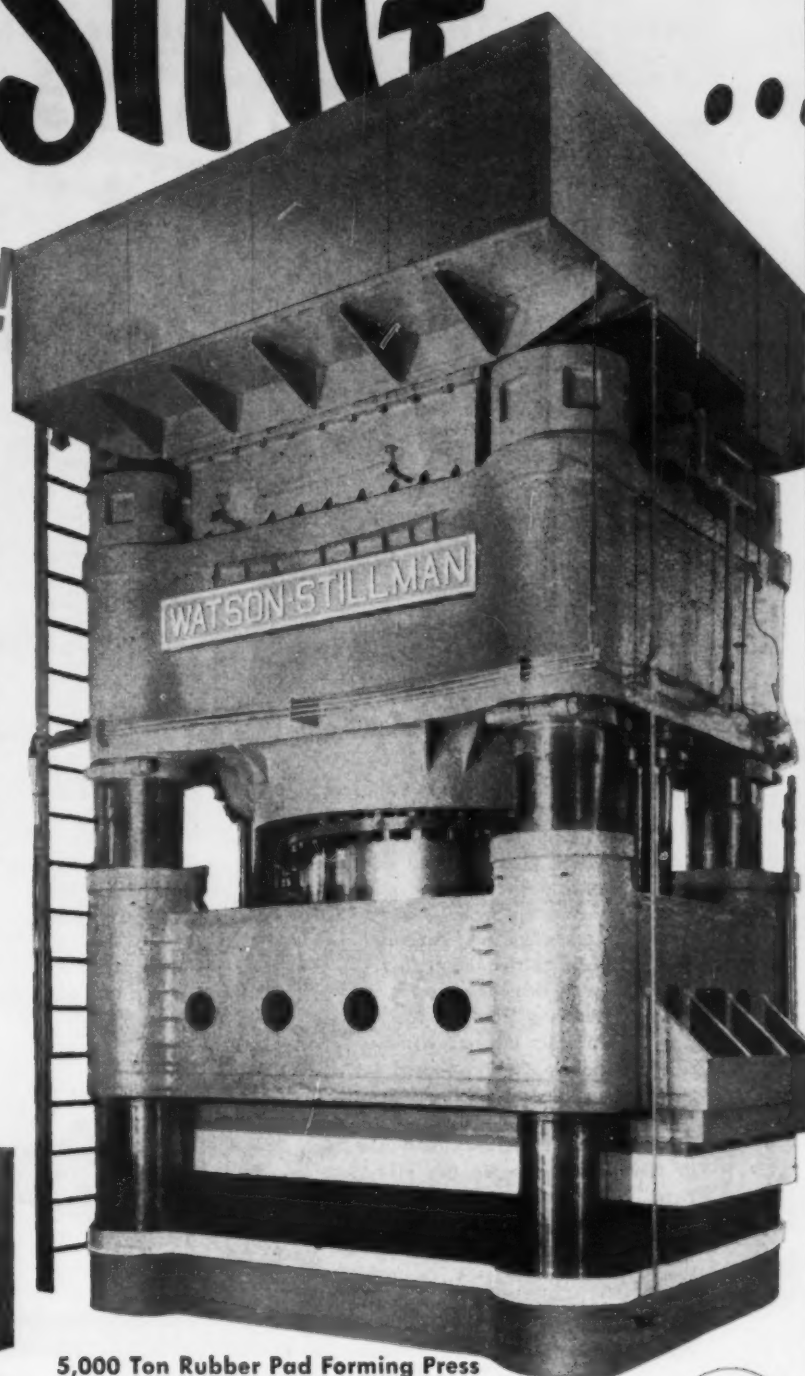
out the
ARMS for UNCLE SAM!

Planes ... tanks ... guns ... shells ... shell cases or any one of a thousand and one other items that must be produced, as long as it can be pressed out of metal, there's a W-S Press to do the job ... and more economically, too.

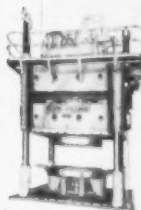
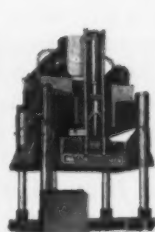
W-S Medium and Deep Draw Presses do things faster. Rejects are virtually eliminated ... present dies and materials can be used ... one or more draws may be cut from a progressive operation, thereby saving man hours on the job ... intermediate annealing is often reduced or eliminated and total production time cut down.

Designed for precision work and built for long service, these W-S Hydraulic Presses offer further advantages in set-up, maintenance and tool life. Available in a large choice of pumping units and controls. It will pay you to investigate their flexibility.

Other W-S Metal Working Presses include those for Forming, Flanging, Trimming, Forging, Coining, Hobbing, Extruding, Briquetting, Bending and Straightening.



5,000 Ton Rubber Pad Forming Press



HYDRAULIC MACHINERY DIVISION

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Denver 2, Colo. Overgard Machine Tool Co.
Indianapolis 20, Ind. W. K. Millholland Mach. Co.
Los Angeles 11, Cal. H. M. Royal, Inc.

Pittsburgh 19, Pa. Stanley Berg & Co.
Portland, Ore. Machinery & Tool Supply Co.
Rochester 12, N. Y. Watson-Stillman Co.
San Francisco 7, Cal. Schellenbach Mach. Tool Co.
Seattle, Wash. Machinery & Tool Supply Co.
Spokane 8, Wash. Machinery & Tool Supply Co.
St. Paul 4, Minn. Anderson Machine Tool Co.

Manufactured in Canada by—CANADIAN VICKERS, Ltd., Montreal

W-S "COMPLETILINE" HYDRAULICS... THE SHORTEST DISTANCE FROM PRODUCTION TO PROFIT

BOOSTED STEERING ADDS TO THE EFFICIENT OPERATION OF THIS...

ALLIS-CHALMERS
HD-15 CRAWLER TRACTOR



SPECIAL ROPER PUMP POWERS HYDRAULIC BOOSTER FOR STEERING

This Allis-Chalmers HD-15 crawler tractor, which develops 102 h.p. at the drawbar, is one of four in the line that now sets a new standard in tractor classification. Among the components that keep this 27,500 pound bruiser going is a special Roper Pump — the power hydraulic booster control for steering. Engineered to withstand the most gruelling operating conditions, this pump has more than proved its worth in years of service in the HD-19. Now Allis-Chalmers is providing the same steering performance in the new HD-15. Yes, Allis-Chalmers knows full well Roper dependability.



INVESTIGATE THE ROPER LINE OF STANDARD PUMPS

Roper "Standard" Pumps — Series 3600, F, K, and H — also figure prominently as original equipment in diversified installations. These Ropers provide a wide selection: sizes 1 to 300 g.p.m.; pressures to 1000 p.s.i., and come standard or special fitted depending on the liquid to be pumped. Send for the Roper catalog and get complete details.



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ROCKFORD, ILLINOIS

• News of Industry •

Turnover Among Execs Cut By Building Nonfinancial Incentives

New York—Industry can cut turnover among executives by developing broader, nonfinancial incentives, according to William B. Given, Jr., chairman of the board, American Brake Shoe Co.

American business is faced with a progressively higher rate of turnover. Recent Bureau of Labor Statistics place this rate at 4.3 per every 100 employees per year. While most job changing is for higher pay, many changes among executive personnel stem from inability of the individual to grow rather than low pay. Brake Shoe, faced with this problem, found it could create a better work atmosphere and keep executives by filling the human needs.

A program was set up aimed at: Finding and keeping executives who inspired confidence; encouraging delegation of authority; giving more attention to the human interests of individuals; letting people know where they stood with the boss; letting men with ideas and ambitions expand out of the ruts.

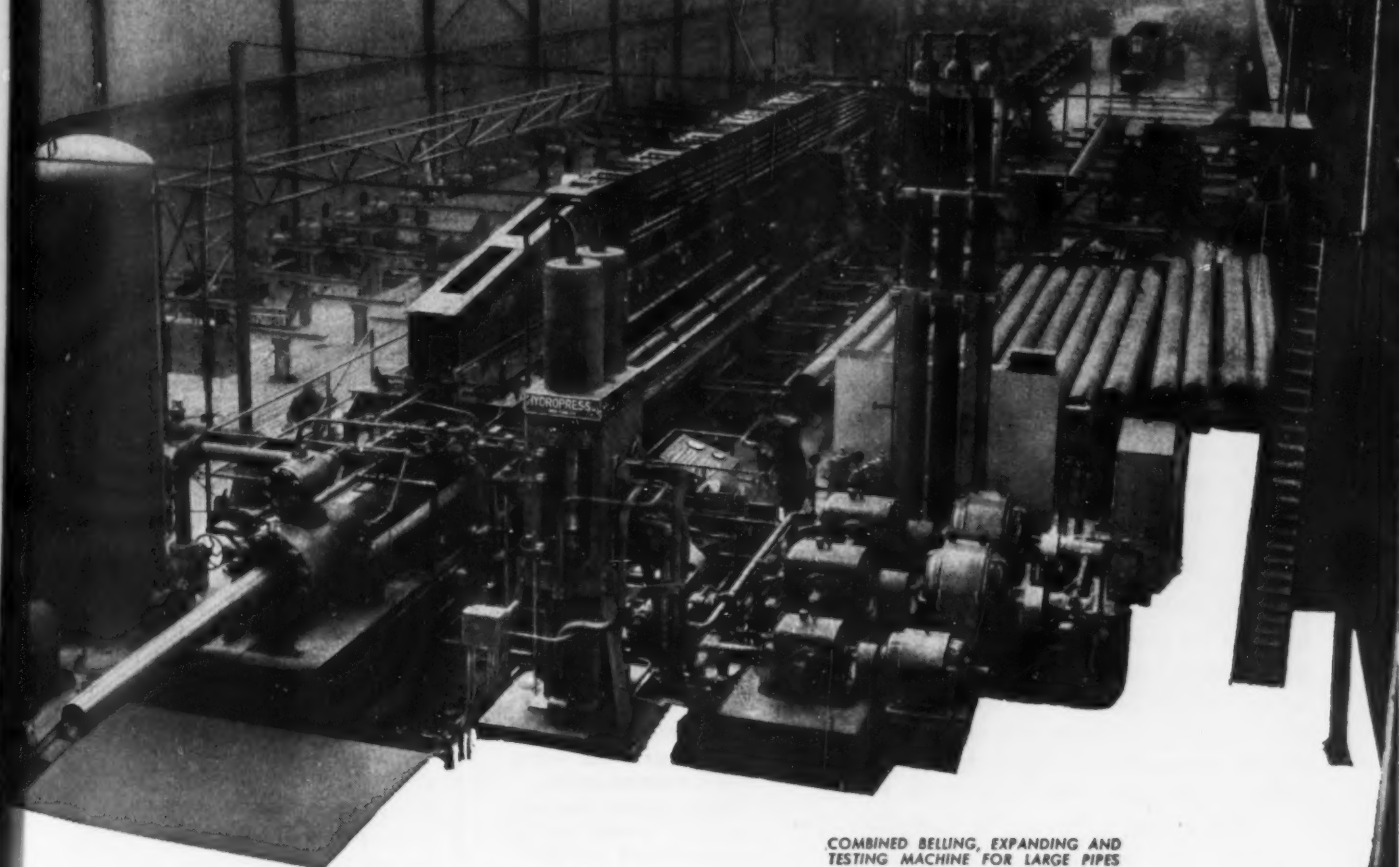
Essex Buys Old Rheem Plant

Birmingham—Essex Wire Corp., Fort Wayne, Ind., has announced purchase of the former Rheem Manufacturing Co. plant here. Operations will begin as soon as machinery and materials are assembled. The plant will manufacture wire for power, telephone and railroad companies. Paul Williams, vice-president and general manager of Midland, will have charge of the Birmingham plant.

Nicaragua Gets Power Credit

Washington — Export-Import Bank has approved a \$600,000 loan to the Nicaraguan Government for power-generating equipment. The credit is to be used by the government-owned power company for purchase of materials, equipment, and services, primarily of a 3000 kw diesel electric generating unit now being manufactured by Nordberg Manufacturing Co., of Milwaukee.

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COMBINED BELLING, EXPANDING AND
TESTING MACHINE FOR LARGE PIPES
maximum test pressure: 5,500 P.S.I.
tube size: 4 1/2" - 16" O.D.
tube length: 17' - 51'
supplied to
Page-Hersey Tubes, Ltd.
Welland, Ont.

HYDRAULIC PIPE TESTING MACHINES

For Combined Belling, Expanding and
Testing on High Production Basis

Belling of both pipe ends, expanding of
full length against a closed mantle,
and hydrostatic test are performed in
one semi-automatic operation.

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SEATTLE
WASHINGTON, D. C.



**"Never leave that
till tomorrow
which you
can do today."**

—Ben Franklin's Almanac, 1757

**If waste and inefficiency ruin thee and thy country today,
how shall thee profit by finding a horseshoe tomorrow?**

—Acme Steel Notebook, 1951

The Acme Steel steel strapping and wire stitching equipment you have today means efficient and thrifty production in your packaging, shipping and materials handling operations. Protect it well.

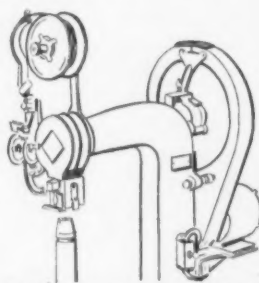
In spite of an increase in productive capacity, U.S. military requirements on some products make it impossible for Acme Steel to meet all the requirements of our more than 50,000 customers. To make the best use of Acme Steel flat strapping, stitching wire and other products available to you, let our representative put Acme Steel's experience and ingenuity to work for you.

In the past 71 years, we have helped our customers weather many a difficult period. We are ready and willing now to help you keep your tools on the job or develop new setups that will increase efficiency in your operations and minimize waste.

Information for ready reference on Acme Steel products is available upon request.

ACME STEEL COMPANY

Dept. 1A-61, 2838 Archer Avenue, Chicago 8, Illinois
We have 46 service offices in the United States and Canada. If not listed in your telephone directory, write us.



**Five things you can do to
keep your Acme stitching
machines on the Job!**

1. Clean and oil every day.
2. Never operate stitcher without material in stitching position.
3. For perfect stitching, check work regularly. If in doubt about any operating difficulty, refer to service manual (additional copies sent upon request) or submit stitched material, identified by machine type and serial number, to Customer Service Department, Acme Steel Company.
4. From time to time moving parts need replacement—keep a supply on hand to make quick, minor replacements.
5. Ask us about the Acme Steel "3-WAY SERVICE PLAN" for equipment repairs.

**ACME
STEEL**

In 1950 Acme Steel had 9135 stockholders—a growth of 21.1% over 1949. They comprised 3223 men, 3089 women, 2260 joint accounts, 563 trusts, corporations and institutions. 646, or 15.9%, of our employees are stockholders.

ACME STEELSTRAP flat steel strapping and ACME UNIT-LOAD carload bracing BAND, SEALS and TOOLS • ACME SILVER-STITCHERS and ACME SILVERSTITCH WIRE for box stitching • ACME-MORRISON METAL STITCHERS and BOOK STITCHERS • ACME-CHAMPION BAG STITCHERS • ACME HOT AND COLD ROLLED STRIP STEEL • ACME GALVA-BOND steel slat stock for Venetian blinds • ACME STEEL SPECIALTIES, including hoops, corrugated fasteners, barbed box straps, nail-on strapping and other container reinforcements • ACME STEEL ACCESSORIES—snips, tool mounts, reel stands, coil holders, coil trays.

• News of Industry •

Steel Companies' 1950 Taxes \$896 Million; 83 Pct Over 1949

New York—Record steel production in 1950 was paced by increases in dollar sales, taxes, net income and employment costs, according to the American Iron & Steel Institute. But by far, the greatest increase for steel companies was taxes.

Revenue of 49 companies, which have over 90 pct of total ingot production, was nearly \$9.4 billion in 1950, an increase of 26 pct over 1949 and 15 pct over 1948. Shipments of steel were up 23 pct last year over 1949.

Taxes rose to \$896 million in 1950, or 83 pct more than in 1949 and about 300 pct above 1940. Federal income taxes totaling \$765 million were 103 pct higher than in 1949.

Will Operate Naval Ammo Depot

Washington—A contract for operation of the naval ammunition depot, Shumaker, Ark., has been awarded to National Fireworks Ordnance Corp., West Hanover, Mass., by the Navy Bureau of Ordnance.

The wartime facility was reactivated last fall and has been operating in a limited way, pending completion of additional facilities for rocket production.

Steel Forging Shipments Up

Washington—Shipments of commercial steel forgings in March totaled 161,000 tons compared to 129,000 tons in February and 109,000 tons in March 1950, according to the Dept. of Commerce. Unfilled orders at the end of March were 875,000 tons, up 12 pct from February.

Tin Use Up 39 Pct In 1950

Washington—Tin consumption in 1950 jumped 39 pct, according to the Bureau of Mines. Use of primary tin was up 52 pct, secondary tin up 20 pct. Total consumption in the year was 102,123 long tons, highest since 1941 when consumption was 134,695 long tons.

HOW

Four Companies Adapted Delta Tools

TO CUT COSTS, UP PRODUCTION

1 SIMPLIFIES ACCURATE LOCATION OF WORK PIECES

Bowen Products Corp., Ecorse, Mich. Locating fixtures, properly positioned beneath spindles, were bolted directly to the table of standard 4-spindle Delta 17" drill press. Fixtures are easily removed when job requirements change.

2 EASY DRILLING OF HEAVY CASTINGS

Racine Pattern Works, Racine, Wis. For drilling large awkward castings, the regular base of standard Delta 17" drill press was replaced with 3-leg spider base, so that drill press can be easily slid to proper positions along flange of heavy bathtubs instead of moving work.

3 ROLLS DRILL PRESS INTO POSITION

Cessna Aircraft Co., Wichita, Kans. A roller bridge carries standard Delta drill press along entire length of airplane main spar or backbone, clamped to work table, for accurate positioning.

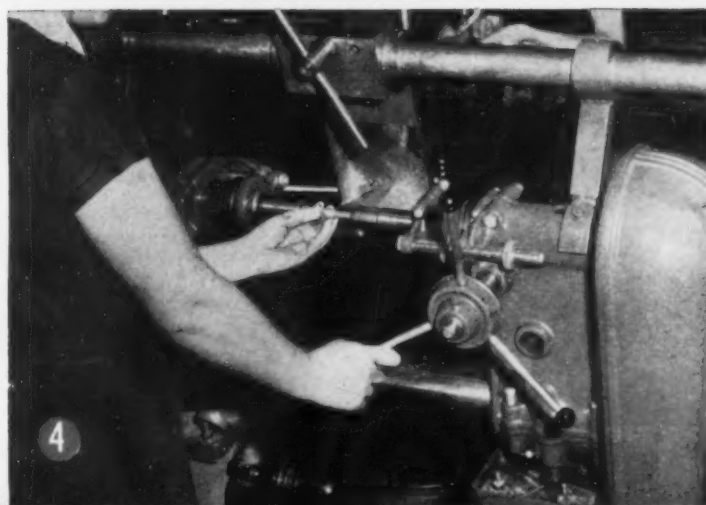
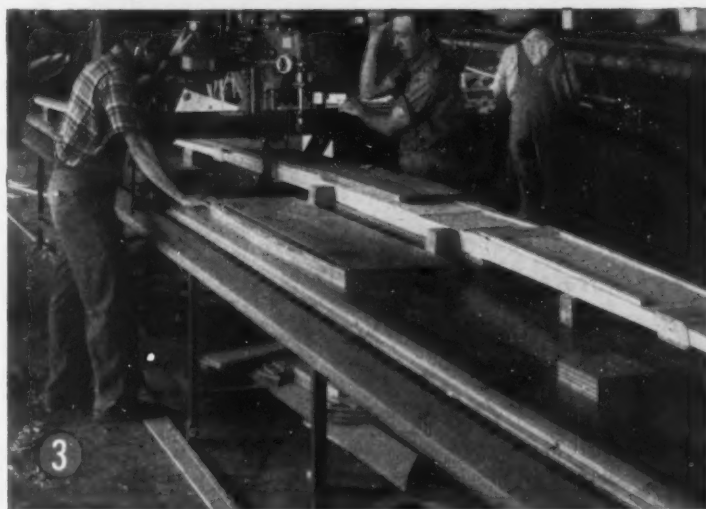
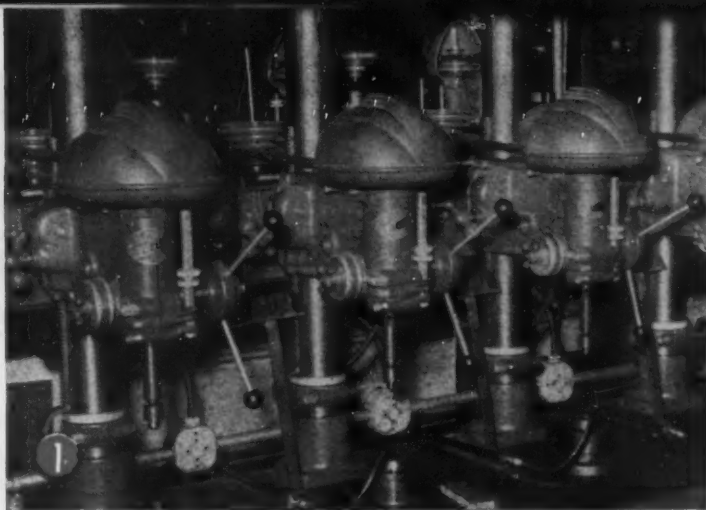
4 REDUCES FATIGUE, DOUBLES PRODUCTION

Suprex Gage Co., Ferndale, Mich. For locking a precision gage, Delta 17" drill press heads are mounted sideways, with special fixture. Company uses girls as operators, reports doubled production, reduced fatigue.

There's a Delta Power tool for your job....

DELTA WOOD AND METAL WORKING TOOLS—
53 MACHINES, 246 VARIETIES, OVER 1300 ACCESSORIES

For Delta dealers, see your Classified
Phone Directory under "Tools"



DELTA
MILWAUKEE

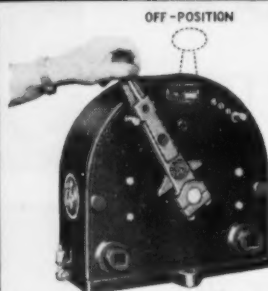
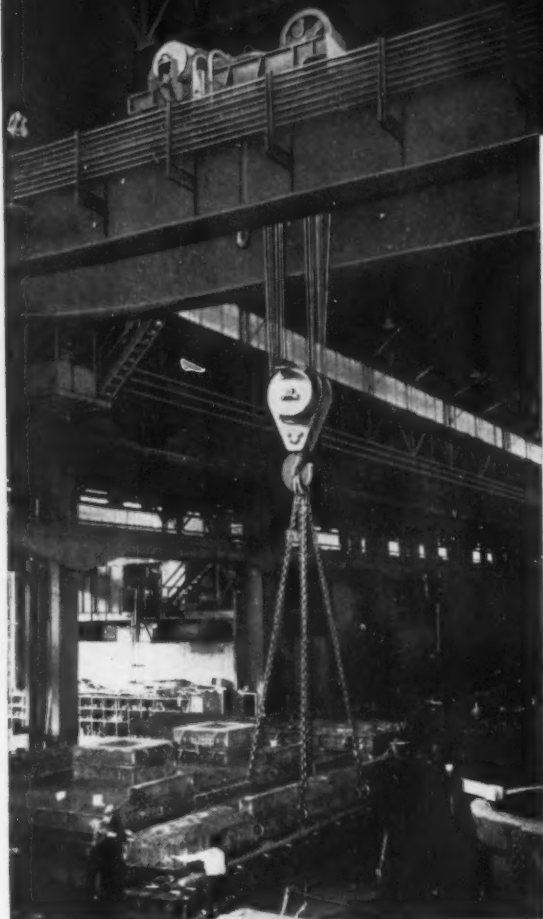


DELTA POWER TOOL DIVISION

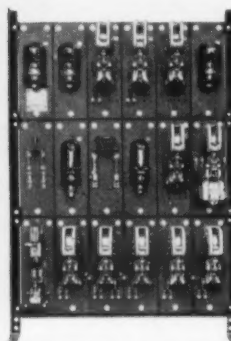
Rockwell
MANUFACTURING COMPANY

631F E. VIENNA AVENUE • MILWAUKEE 1, WISCONSIN

HEAVY LOADS SPOTTED QUICKLY, SAFELY

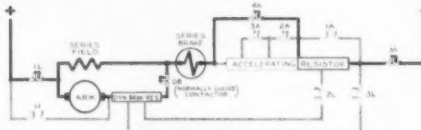


Speed-control Master Switches have short throw—narrow width—and are convenient for the operator to use.



The Wright Dynamic Lowering Circuit Controller (with protection) for crane-hoists.

First point lowering connections put all the current from the line through the brake for fast release.



Here's Where EC&M CONTROL Gives Unexcelled Results

The EC&M Wright Dynamic Lowering Circuit Controller for crane-hoists is well known for its ability to permit accurate, short movements when spotting a load. The operator has complete control of all lowering speed-points. In setting the cope with this 125-ton crane, quick response through fast brake release enables the operator to close the mold carefully—with a minimum number of movements which maintenance

men recognize as a contributing factor to reduced up-keep. The Wright Circuit is safe—specify EC&M Crane Control.



WRITE FOR BULLETIN 921

Photo—Courtesy, Cleveland Crane & Engineering

THE ELECTRIC CONTROLLER & MFG. CO.

2698 EAST 79th STREET

CLEVELAND 4, OHIO

• News of Industry •

Report on Magnetite Deposits May Speed Development of Mines

Washington—A preliminary report on geologic studies of magnetite deposits in St. Lawrence County, New York, has been released prior to formal publication because of "great interest in the region by the iron mining industry," reports the Dept. of Interior.

Made by Geological Survey scientists, the study is expected to aid in the development of newly-discovered iron deposits in St. Lawrence County. The district has two active mines, Benson and Clifton, now produce about 1 million tons of high quality magnetite concentrate annually. This is about half the output of the state.

Deny Higher Lead Duties

Washington—U. S. Tariff Commission has denied the Emergency Lead Committee's request for higher import duties on lead-bearing ores, flue dust, mattes, lead bullion, base bullion, lead in pigs and bars, lead dross, reclaimed lead, and scrap lead.

The Committee said in filing its application for higher tariffs last February that imports were proving injurious to domestic industries. The Tariff Commission, in a recent decision said it found no evidence to this effect.

Order Hollow Extruded Props

Caldwell, N. J.—Royal Dutch Airlines has placed the first commercial order for hollow-steel blades produced under the Curtiss-Wright extrusion process (THE IRON AGE, Mar. 1, 1951, p. 125). Large orders have also been placed by the United States Air Force. The process eliminates welding and much machining.

CECO Expands in Kansas City

Chicago—Ceco Steel Products Corp., big independent reinforcing steel fabricator, has announced an expansion program for its Kansas City branch. An 8.5-acre tract in the Fairfax industrial district has been purchased. Ceco plans a 50,000 sq ft warehouse-fabricating plant there.

ELECTRUNITE TUBING

Eases Life-

FOR THE MANUFACTURER...



FOR THE PATIENT...

HOSPITAL PATIENTS can relax in every position, from full-reclining to upright, in this sturdy rejuvenating chair made by Barcalo Manufacturing Company. Steel tubing provides the stiffness and rigidity to make the chair steady and reassuring to the patient, yet light to move.

The manufacturer likes the way ELECTRUNITE Steel Tubing works on this application. Uniform ductility and wall thickness assure rapid, predictable forming and bending of the tubes to shape. Where tube ends must be fully flattened at joints, there's no trouble with cracks and fractures. The excellent surface of this ELECTRUNITE Tubing requires no special handling or trick treatments to hold long-lasting finishes under severe service.

Have you considered using ELECTRUNITE Steel Tubing in your essential products, such as these invalid chairs? We'll be glad to discuss your problems . . . and offer you the benefits of Republic's 3-Dimension Metallurgical Service. It's the helpful service that focuses the knowledge and experience of field, mill, and laboratory metallurgists on your fabrication problems.

**REPUBLIC STEEL
CORPORATION**

STEEL & TUBES DIVISION

224 EAST 131st STREET
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Republic
ELECTRUNITE TUBING

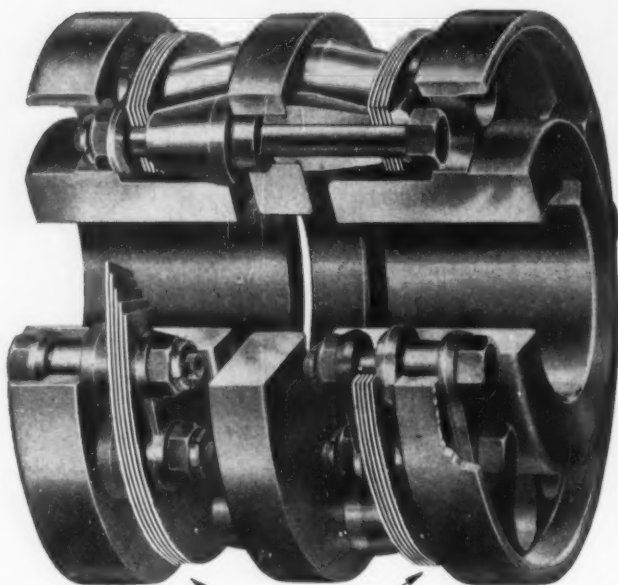
THOMAS *Flexible* ALL METAL COUPLINGS

FOR POWER TRANSMISSION • REQUIRE NO MAINTENANCE

Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

Thomas Couplings have a wide range of speeds, horsepower and shaft sizes: $\frac{1}{2}$ to 40,000 HP—1 to 30,000 RPM.

Specialists on Couplings for more than 30 years



PATENTED FLEXIBLE DISC RINGS

**BACKLASH
FRICTION
WEAR and
CROSS-PULL**
are eliminated
LUBRICATION IS
NOT REQUIRED!

THE THOMAS PRINCIPLE GUARANTEES
PERFECT BALANCE UNDER ALL
CONDITIONS OF MISALIGNMENT.

NO MAINTENANCE PROBLEMS.

ALL PARTS ARE
SOLIDLY BOLTED TOGETHER.



Write for the latest reprint of our Engineering Catalog.

THOMAS FLEXIBLE COUPLING CO.
WARREN, PENNSYLVANIA

• News of Industry •

OPS Picks Nonferrous Castings Committee to Advise on Pricing

Washington—Appointment of a nonferrous casting industry advisory committee has been announced by OPS. The new group will advise OPS.

Members of the Nonferrous Castings IAC are A. C. Runnette, Aluminum Company of America, Pittsburgh; Grant Roth, Ace Foundry Co., Chicago; B. J. Claffey, Acme Aluminum Alloys, Dayton; Anthony Cristello, American Light Alloys, Inc., Little Falls, New Jersey; Otto G. Gundel, Buckeye Brass and Manufacturing Co., Cleveland; H. C. Fechtmeyer, Ampco Metal, Inc., Milwaukee; Frank J. Halligan, Baldwin Lima Hamilton Corp., Philadelphia; T. W. Pettus, American Brake Shoe, St. Louis; William A. Gluntz, Gluntz Brass and Aluminum Foundry Co., Cleveland; Fred H. McCullough, Springfield Bronze and Aluminum Co., Springfield, Mass.; Fred H. Buckingham, Sandusky, O.; C. E. Piper, Erie Bronze Co., Erie; F. V. Wilson, Standard Brass and Manufacturing Co., Port Arthur, Tex.; R. H. Osbrink, R. H. Osbrink Manufacturing Co., Los Angeles.

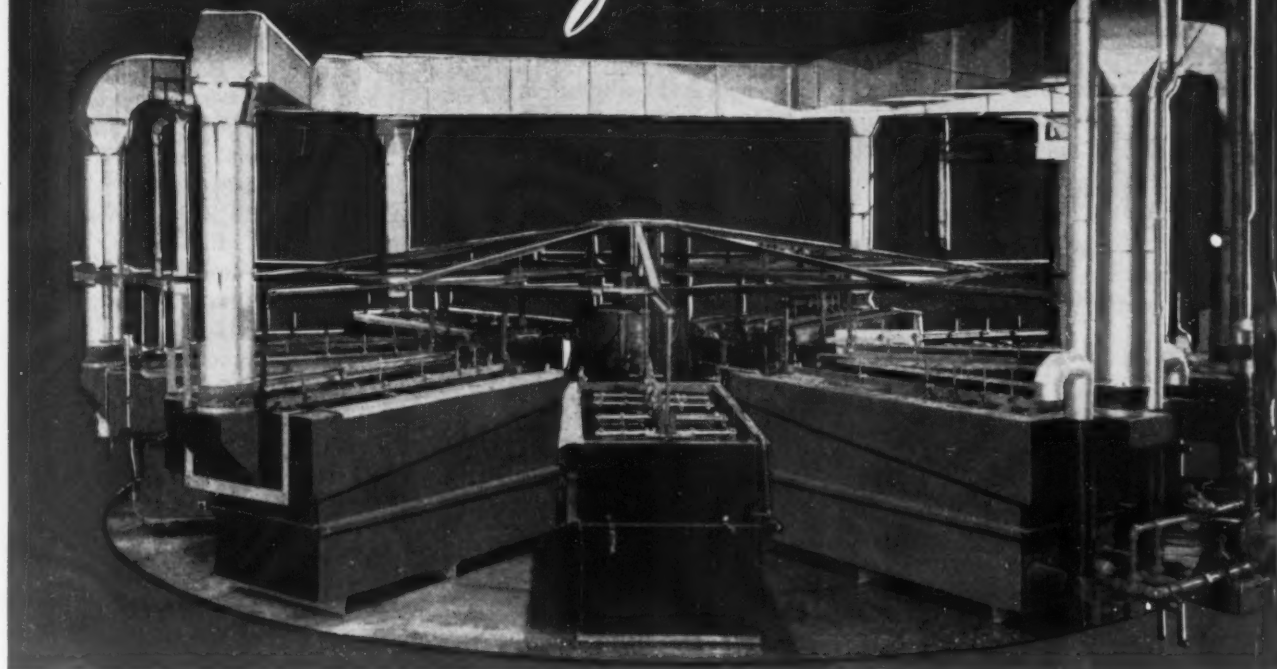
Urge Engineers' Registration

New York—Proposals that all engineers to age 70 be registered, and that a National Engineering Personnel Board be established to classify registrants are being pushed by the Engineers Joint Council to fight the current shortage of critical engineering skills. EJC is also conducting a campaign to get more students into engineering schools.

Puerto Rico Buys Pressure Pipe

Dallas—First foreign shipment of cast iron pressure pipe has been made by Lone Star Steel Co. The pipe, valued in excess of \$100,000, was sold to the Puerto Rico Aqueduct Authority. The tar-dipped pipe was accumulated because capacity for pipe production is in excess of capacity for cement lining. Cement lining capacity is being expanded.

Defense OR HEAVY DUTY JOBS UDYLITE ROTARY FULL AUTOMATIC PLATING MACHINE *Can't be Equaled*



Here's the heavyweight champ of the metal finishing field—designed especially for those tough defense jobs—Udylite's Rotary Full Automatic. The tremendous power and flexibility of its hydraulic drive make a simple matter of processing work pieces of any size or shape. It's ideal for pickling and bonderizing shell and rocket casings—for etching stainless steel jet engine rotors—anodizing aluminum aircraft parts. It can handle any metal finishing operation vital to building the sinews of defense.

Mechanically simple, the Udylite Rotary is constructed in the shape of a cartwheel. The tanks may be arranged radially around the lift shaft like the spokes of a wheel or placed end to end

like a wheel's rim. Either arrangement allows easy access to the tanks for servicing the solution. This machine is very easy to install—it is shipped ready to run. Since it has few moving parts, maintenance is held to a minimum. If you have a large volume of heavy parts production, it will pay you to ask your Udylite Technical Man about the Rotary Full Automatic for plating and other metal finishing processes. Or, if you prefer, write to us direct for full information. There's no obligation.

PIONEER OF A BETTER WAY IN PLATING

THE
Udylite

CORPORATION

DETROIT 11, MICHIGAN

REMOVE

SCALE OXIDES FLUX

new-improved

Faster, easier with [^]WYANDOTTE A.E.

WYANDOTTE A.E. IS A PICKLING AGENT that, in general, can effectively and advantageously replace hydrochloric and sulfuric acids. Because it's a mixture of powdered acid salts, the new, improved A.E. is easy to control. And the difference in results? A.E. contains synthetic wetting agents that "wet

out" and rinse fast, leaving surfaces clean and really bright!

Ask your Wyandotte Representative to show you how easy the new A.E. is to use, how it does a much better job for you.

P.S. If you have a cleaning problem of any sort, write Wyandotte for free technical help.

Wyandotte A.E. is a pickling agent that's balanced to give a wide range of applications. Users report superior results of A.E. over previous methods in the following applications:

On zinc base die castings following electrocleaning and prior to plating

On brass following electrocleaning and prior to plating

For removing heat treat scale from ferrous parts in tumble barrels

For removing heavy tarnish from brass

For removing dirt, scale, oxide from automobile radiators

For removing scale and rust from steel after electrocleaning and prior to electroplating

For removing rust and spot weld marks from parts in tumble barrel applications, prior to barrel plating

For removing flux after brazing operations

NEW

WYANDOTTE A.E.

Wets out and rinses fast

Gives a bright finish

Is very easy to handle—not dusty

Eliminates water or acid spotting

Does not give off obnoxious fumes

Has long solution life

Less critical to control



THE WYANDOTTE LINE—products for burnishing and burring, vat, electro, steam gun, washing machine and emulsion cleaning, paint stripping, acid pickling, related surface treatments and spray booth compounds. An all-purpose floor absorbent: Zorball. In fact, specialized products for every cleaning need.

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WYANDOTTE, MICHIGAN

Service Representatives in 88 Cities



Wyandotte
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• News of Industry •

Hayes Aircraft Tooling Up For Plane Modification Program

Birmingham — Tooling up for overhauling of B-25 bombers for the U. S. Air Force will begin immediately by Hayes Aircraft Co. at the former Bechtel-McCone modification center here, according to R. W. Clark, president of Hayes Mfg. Co. of Grand Rapids, Mich., parent organization of Hayes Aircraft.

Harry T. Rowland, former executive vice-president of Glenn L. Martin Co., has been named president and general manager of Hayes Aircraft.

When it was announced in April that the Air Force had awarded the modification contract to Hayes, it was stated that about 1000 workers would be employed. The company has leased 286,000 sq ft of the 1,800,000 sq ft available at the huge facility.

Steel 80 Pct of Metal Output

New York—Some 80 pct of all metals in all forms came from the iron and steel industry, according to the American Iron & Steel Institute. All but 4 pct of the 93 million tons of iron and steel shipped by American producers in 1950 went into products for American consumers.

Finished steel accounted for 72.2 million tons of total product. Cast ferrous products added another 15 million tons. Over 5 million tons of pig iron went to foundries.

Aluminum, copper, brass, lead and zinc, including materials for alloys or coatings used in finished steels, totaled 5.6 million tons.

Many New Locomotives Added

New York — Progress in modernizing the nation's railroads marched forward with installation of 838 new locomotives in the first 4 months of 1951. All but four of these were diesel-electric units. In the same period in 1950 692 new units were installed. As of May 1 this year Class I railroads had 1755 new locomotives on order, of which 1733 were diesel-electrics.

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for urgent military and
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PRIME WESTERN

SELECT

BRASS SPECIAL

INTERMEDIATE

HIGH GRADE

SPECIAL HIGH GRADE

AMERICAN ZINC SALES COMPANY

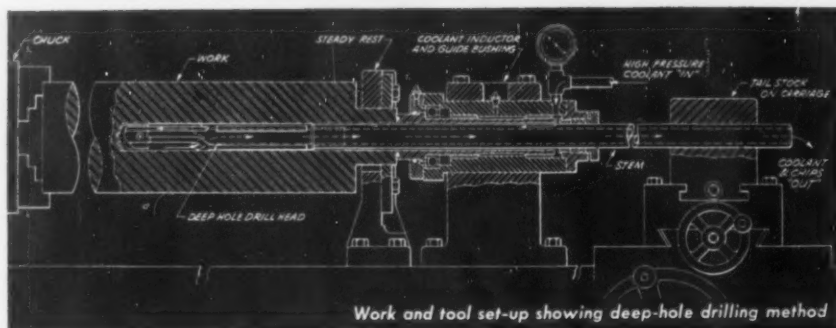
Distributors for

AMERICAN ZINC, LEAD & SMELTING COMPANY

Columbus, O. Chicago St. Louis New York

June 21, 1951

141



Work and tool set-up showing deep-hole drilling method



Conner Guided Deep-Hole Drill for extremely deep holes

DEEP HOLE ENGINEERING

Now is the Time!

Today many manufacturers are faced with new and often perplexing problems of production machining unfamiliar to the operating personnel of their plants.

It may be that deep holes and large diameter holes are called for in tough and hard steels and alloys.

If such is your case, now is the time to employ our services for consultation, preferably when your project is yet in its initial planning stage.

Our services should include relating the requirements of the job to your facilities, and, if warranted, providing you with a formal method study evaluating all possible lines of approach.

Thus, by employing us at a nominal engineering fee, you would arrive at a properly arranged sequence of operations, the correct choice of machines and other facilities, your power requirements, a close estimate of the time the operation will consume, and the tool design best suited to the work.

Many leading manufacturers of armament, machine tools, electrical and oil field equipment are relying on our deep hole engineering service, tool designing, deep hole drills and boring tools.

You too will find it profitable to consult us.

Deep Holes Exclusively

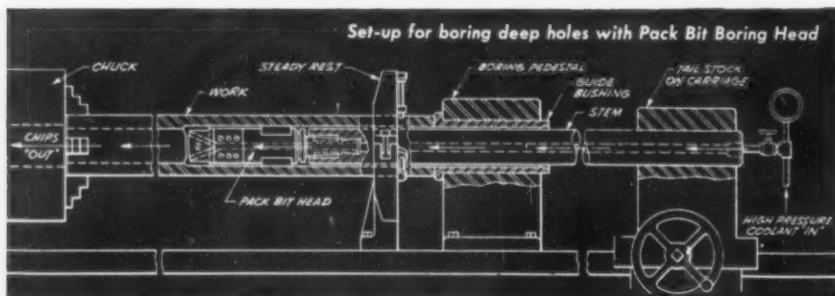
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1000 East McNichols Road, Detroit 3, Michigan

Conner
TOOL & CUTTER CO.



Conner Pack Bit Boring Head



Set-up for boring deep holes with Pack Bit Boring Head

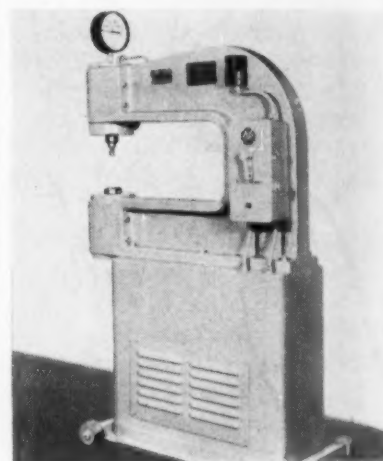
new equipment

Continued from Page 40

Annealing spider

As contrasted to cross-member construction, a new type annealing spider has a large central pipe, with eight smaller pipes welded to its perimeter, holding the wire coils round with only a line contact. This construction is said to give an equal distribution of heating and cooling forces that prevent warping during the annealing process. Overall height is 81 in.; diameters range from 10 to 30 in. *KIF Industrial Fabricators.*

For more data insert No. 14 on postcard, p. 37



Brinell hardness tester

Made for armor plate testing but adaptable for other requirements needing a deep-throated hardness tester, this C-frame machine is mounted on wheels to roll out of the way when not in use and to be rolled into position, reaching out over a conveyor. The lower anvil is the top of a hydraulic piston that rises as the load is applied to take the pressure off the conveyor. Anvil height can conform to customer's conveyor height. Maximum vertical opening between ball penetrator and anvil is 4 in. The operating cycle is controlled by a snap switch, which, when turned on, applies the 3000 kg load. Diameter of the impression is measured with a Brinell microscope. Hydraulic unit is in the base of the machine. *Steel City Testing Machines, Inc.*

For more data insert No. 15 on postcard, p. 37

Turn to Page 144

THE ACTUAL IS LIMITED:

THE POSSIBLE IS IMMENSE

NEW LINCOLN PLANT CREATED BY INCENTIVE-INSPIRED CO-ACTION IN DEVELOPING POSSIBILITIES IN PRODUCT

© LE Co. 1951

SAVES 94% WITH WELDED STEEL

Machine designs that utilize the economies of welded steel are always lower in cost. As shown in the development of this typical machine part, substantial production savings are possible because:

Steel costs less per pound and fewer pounds are needed. The initial cost-saving advantage is 7 to 1 with steel, considering strength and safety factors alone.

Approaches to efficient product shape are endless. Stronger materials themselves can be more easily concentrated in the load-carrying areas, giving greater strength, more rigidity per pound of metal. Unlimited combinations of steel shapes can be utilized, enabling lower cost manufacture with a minimum of shop equipment.

Get the facts now. Your Lincoln Welding Engineer will show how your products can be fabricated with less metal and at lower cost. Simply call or write.

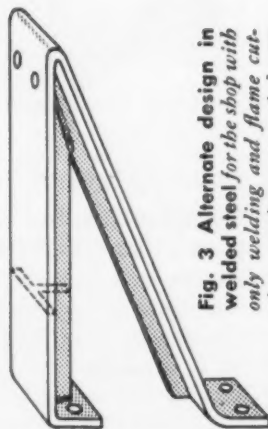


Fig. 3 Alternate design in welded steel for the shop with only welding and flame cutting equipment weighs 35 pounds... costs only \$4.70... a saving of 48% over Figure 1.

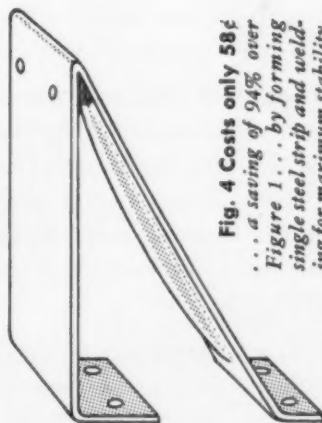


Fig. 4 Costs only 58¢... a saving of 94% over Figure 1... by forming single steel strip and welding for maximum stability. Weighs only 9 pounds.

the ACTUAL

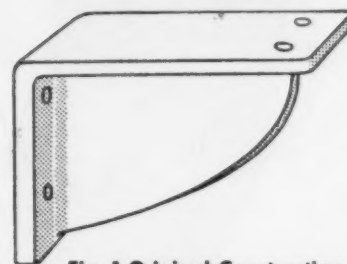


Fig. 1 Original Construction. Machinery bracket weighs 39 pounds. Has $\frac{3}{4}$ " and $\frac{1}{2}$ " sections. Requires milling and drilling. Costs \$9.10.

increasing the YIELD

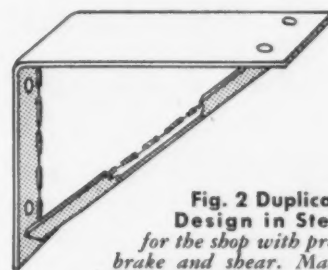


Fig. 2 Duplicate Design in Steel for the shop with press brake and shear. Made from 8 gauge (approximately $\frac{1}{8}$ " sheet... saves 27 pounds of metal. Costs \$5.13 less than original construction.

the IMMENSITY of the POSSIBLE a saving of 56% in cost

PROGRESSIVE DESIGN CUTS COSTS FURTHER

Machine Design Studies available to designers and production men. Write on your letterhead to Dept. 57,

THE LINCOLN ELECTRIC COMPANY
CLEVELAND 1, OHIO



Typical of some of the larger parts cast centrifugally and precisely finished at Shenango, this is a 45" cylinder bushing for use in a big hydraulic metal forming press.

CENTRIFUGALLY CAST BY SHENANGO . . . for a longer life under pressure

THERE'S a way to save important money on symmetrical parts subjected to high pressures and stresses. You can do as so many companies do—turn to Shenango for centrifugally cast parts or assemblies . . . large or small . . . ferrous or non-ferrous . . . semi-machined or precisely finished to specifications.

At the modern Shenango works you'll gain by the most advanced techniques in centrifugal casting. Metal for metal you get greater

strength and better resistance to wear or abrasion, to say nothing of relief from sand inclusions, blow holes and other often hidden defects.

GET ALL THE FACTS on Shenango time-and-money-saving service and qualities. Send for Bulletin No. 150 on non-ferrous parts; Bulletin No. 151 covering parts of Meehanite Metal, Ni-Resist and special alloy irons.

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SHENANGO

ALL RED BRONZES • MANGANESE BRONZES • ALUMINUM BRONZES
MONEL METAL • NI-RESIST • MEEHANITE METAL

new equipment

Continued

Rust preventive

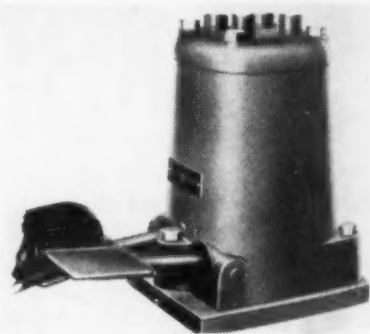
Powerfilm, a rust and corrosion preventive coating, gets under and displaces any moisture present on metal surfaces. When brushed, sprayed, or wiped on, it dries to form a tough non-oily protective film that will not crack or chip, and dust or dirt does not stick to it. As an underbody coating, it seals the surfaces of metal parts; when wiped down on car finishes, it gives a highly polished protective film. Powerfilm is removed with naphtha. Thomas Co.

For more data insert No. 16 on postcard, p. 37

Curved line type holder

A holder for simplifying the stamping of curved line markings on the ends of small rounded parts features a unique type holding mechanism. Type can be set in a partial or complete circle. Special taper sided type is used, but no slots are required for retaining it in the holder. M. E. Cunningham Co.

For more data insert No. 17 on postcard, p. 37



Foot operated valves

Quick-As-Wink foot operated valves permit hammers, shears, presses, hopper gates, furnace doors, and other air operated machinery and equipment to be fully controlled by foot pressure on a pedal. The valving mechanism has stainless steel body and push-pull rods, brass sleeves, self-sealing U-shaped packers. Sizes are 3/8 to 1 in., 3-way, 4-way, neutral position and regular actions; single and two pedal designs for air to 150 psi and 150°F. C. B. Hunt & Son, Inc.

For more data insert No. 18 on postcard, p. 37

Turn to Page 146

*For more efficient
deep drawing...*

THIS
Version
DOUBLE ACTION
DEEP DRAWING
PRESS

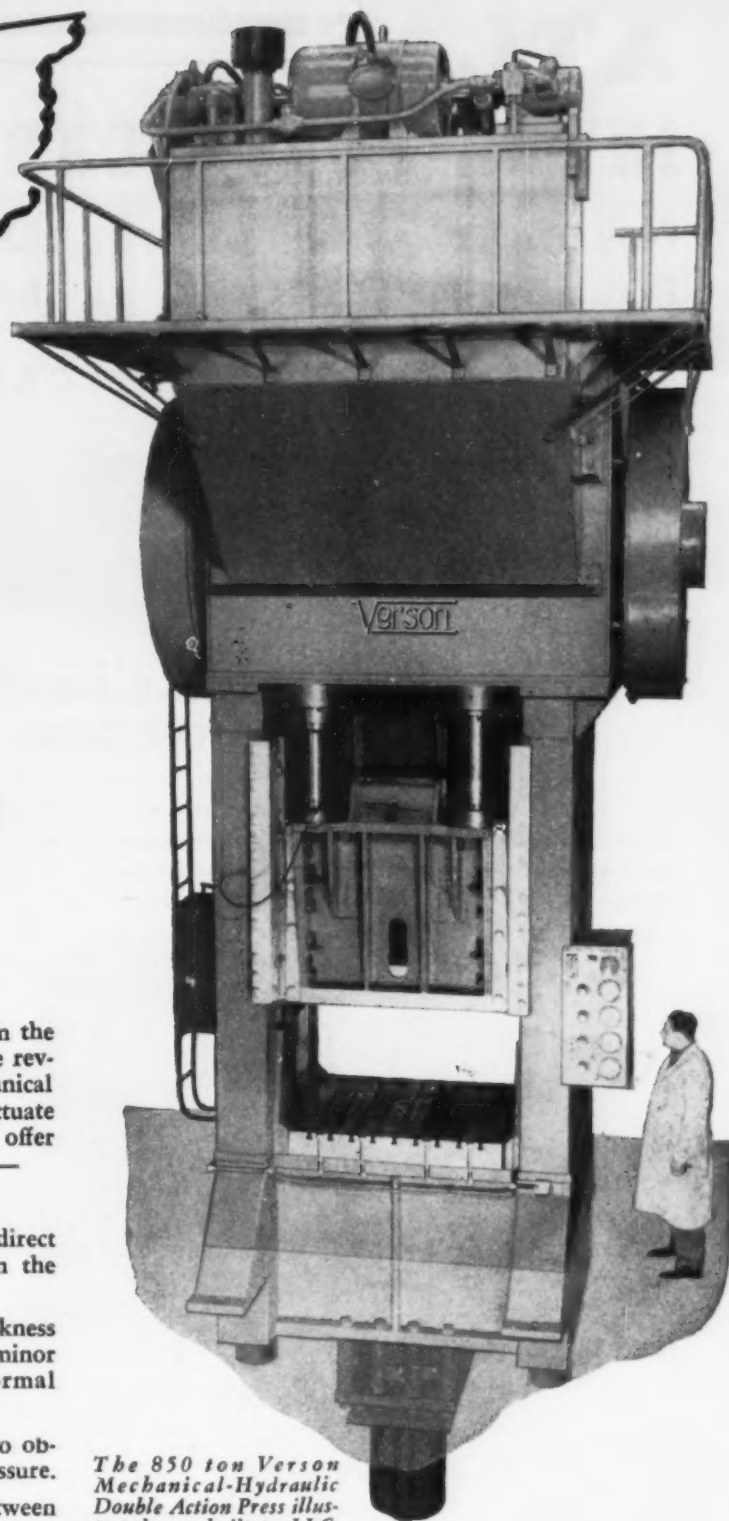
combines mechanical
and hydraulic
force application

TYPICAL of what "know-how" can mean in the design and building of better presses is the revolutionary press illustrated. By utilizing mechanical force to drive the ram and hydraulic force to actuate the blankholder, it is now possible for us to offer these important advantages for deep drawing —

- ★ Increased production.
- ★ Instantaneous adjustment of pressure and direct reading gauges for any pressure point on the blankholder.
- ★ Self-adjustment of blankholder for any thickness of stock and automatic compensation for minor variation in stock thickness during normal operation.
- ★ Elimination of need for the use of shims to obtain correct and uniform blankholding pressure.
- ★ Elimination of tool-damaging impact between blankholder, stock and die.

Write for complete details.

*The 850 ton Version
Mechanical-Hydraulic
Double Action Press illus-
trated was built to J.I.C.
standards and operates at
7 strokes per minute.*



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A VERSION PRESS FOR EVERY JOB FROM 60 TONS UP!

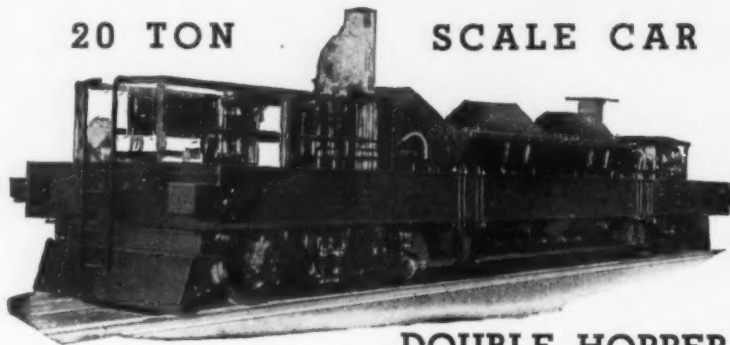
MECHANICAL AND HYDRAULIC PRESSES AND PRESS BRAKES • TRANSMAT PRESSES • TOOLING
DIE CUSHIONS • COMPRESSION AND TRANSFER MOLDING PRESSES

ATLAS

INTRA-PLANT CARS

DESIGNED AND ENGINEERED
FOR YOUR SPECIFIC NEEDS

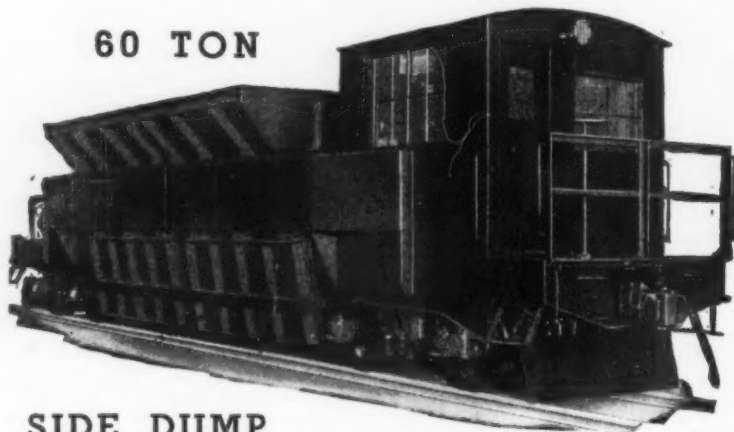
20 TON SCALE CAR



**DOUBLE HOPPER
BOTTOM DUMP**

Car has Atlas underslung suspension scales with Atlas 24" Scale Dial with chart recording. Air brakes and air-operated discharge gates. Cast steel side-frame trucks with Roller Bearings.

60 TON



**SIDE DUMP
ORE TRANSFER CAR**

900 cu. ft. capacity, two-section hopper with electric heaters. Each section has independently-operated discharge gates. Car is equipped with air brakes, automatic couplers, headlights and whistle. Each truck mounts one 75-HP motor.

Atlas Engineering Service is always at your service.



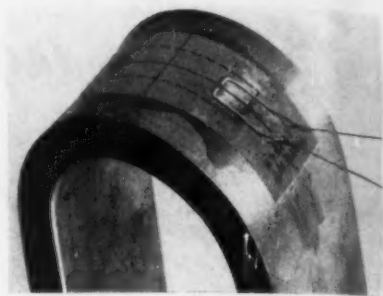
THE ATLAS CAR & MFG. CO.

ENGINEERS MANUFACTURERS

1140 IVANHOE RD. CLEVELAND 10, OHIO, U. S. A.

new equipment

Continued



Post-Yield strain gage

Strains up to 10 pct in materials or parts can be measured accurately by means of a new SR-4 Post-Yield strain gage. The new PA-3 has a flat-grid paper-base construction and requires a special air-drying cement that is supplied with it along with instructions for application. It has a resistance of 120 ohms, gage factor of 2.0, gage length of 13/16 in., and minimum trim width of 15/32 in. *Baldwin-Lima-Hamilton Corp.*

For more data insert No. 19 on postcard, p. 37

Bronze bearings

Bronze steel-backed bearings combine strength and lightness for heavy-duty applications, especially those involving temperature extremes. Produced by a new non-mechanical bonding process, the bronze of the bearing adheres absolutely to the steel backing. Bearings, using a steel such as Nitralloy combined with a high lead bronze can be heat treated to temperatures of 1100-1200°F. Using a long grain bronze, processing can be accomplished to 1500-1600°F. *Beauideal, Inc.*

For more data insert No. 20 on postcard, p. 37

Indexing drill selector

For fractional size drills from 1/16 to 1/2 in., an indexing drill selector provides a convenient means of keeping drills handy for quick selection of the proper size. The unit mounts on the drill press column or on the wall. Drill sizes are marked on the side of the case that revolves on the supporting bracket. *W. A. Horejsi Co.*

For more data insert No. 21 on postcard, p. 37

Turn to Page 148

MEN AND MACHINES *Serve You* FAITHFULLY

...When You Order From

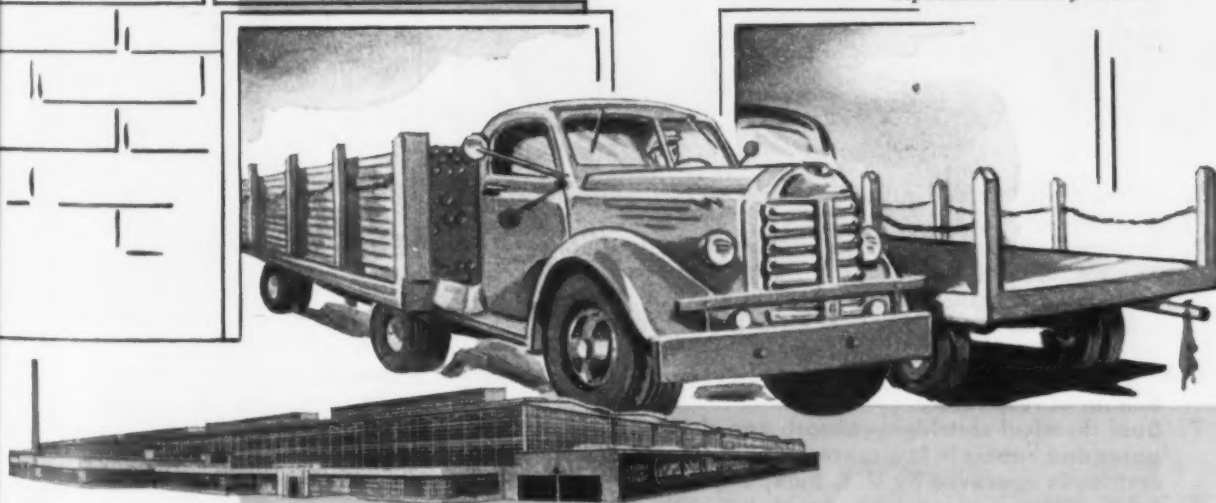
CENTRAL STEEL

HUNDREDS OF TRUCKS In and Out Daily
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There are no "bottlenecks" at Central Steel. Trucks enter the spacious inside loading dock without delay, are loaded quickly and carefully by experienced crews, and are on the way, in a matter of minutes, to your production line—regardless of the size of their load.

To maintain this swift in-and-out service, Central Steel has every essential facility at its command. An intelligent order taking department. Efficient order filling, and stock control systems. Exacting cut-to-order equipment. The latest and best materials handling devices, plus a sincere desire to serve you well.

Call Central Steel first when you need metal and profit from this faster, dependable delivery service.



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Carbon & Alloy • Stainless
Copper • Brass • Aluminum
Expanded Metal •
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At Published Prices

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More Wearing Comfort--
More Willingness to Wear

The NEW WILLSON "800" Series Chemical Cartridge Respirators



1. Lightweight, molded rubber facepiece—soft, snug-fitting comfort.
2. Resilient, rolled, feathered edge—tight, effective seal.
3. Flexible, molded chin cup—comfortable and secure.
4. Adjustable, elastic head and neck bands.
5. Self-adjusting fit over bridge of nose—without reinforcement.
6. Improved exhalation valve—located out of the way at bottom of respirator.
7. Dual chemical cartridges—absorb and chemically filter gases and vapors in low concentrations. Organic vapor cartridges approved by U. S. Bureau of Mines.
8. Large filtering areas—easy breathing with minimum resistance.

WILLSON[®]
"Established 1870"

See your WILLSON Distributor
or write us direct.

WILLSON PRODUCTS, Inc., 231 Washington St., Reading, Pennsylvania

new equipment

Continued

Material handling unit

The unit comprises tools and planning aids for making material handling flow diagrams in manufacturing plants, warehouses and transportation terminals. Two instruction booklets describe the proper method of preparing flow diagrams and give step-by-step directions for analyzing and improving material handling methods. *Triometric, Inc.*

For more data insert No. 22 on postcard, p. 37

Stamping ink

Maximum adherence to all metals is claimed for a non-corrosive and non-etching stamping ink, called Stamp-ink. It is resistant to the action of petroleum type cleaning fluids, oils and greases, including hydraulic oils and chlorinated solvents. When applied to degreased metals it dries fast by evaporation of the solvents leaving a tightly adhering film that is resistant to abrasion. The register is sharp. *Organic Products Co.*

For more data insert No. 23 on postcard, p. 37



Self-locking nut

A new triangular shaped retaining nut has a drawn helical segment with a tapered inner edge that forms a single thread conforming with American standards. When screwed on a threaded shaft, the dished triangular body flattens under torque and secures an equal load distribution against the part being held. Separate washers are unnecessary. Under spring tension the threaded helical segment engages the full depth of the circumference of the screw thread approximately 300°. *Waldes Kohlenoor, Inc.*

For more data insert No. 24 on postcard, p. 37
Turn to Page 150

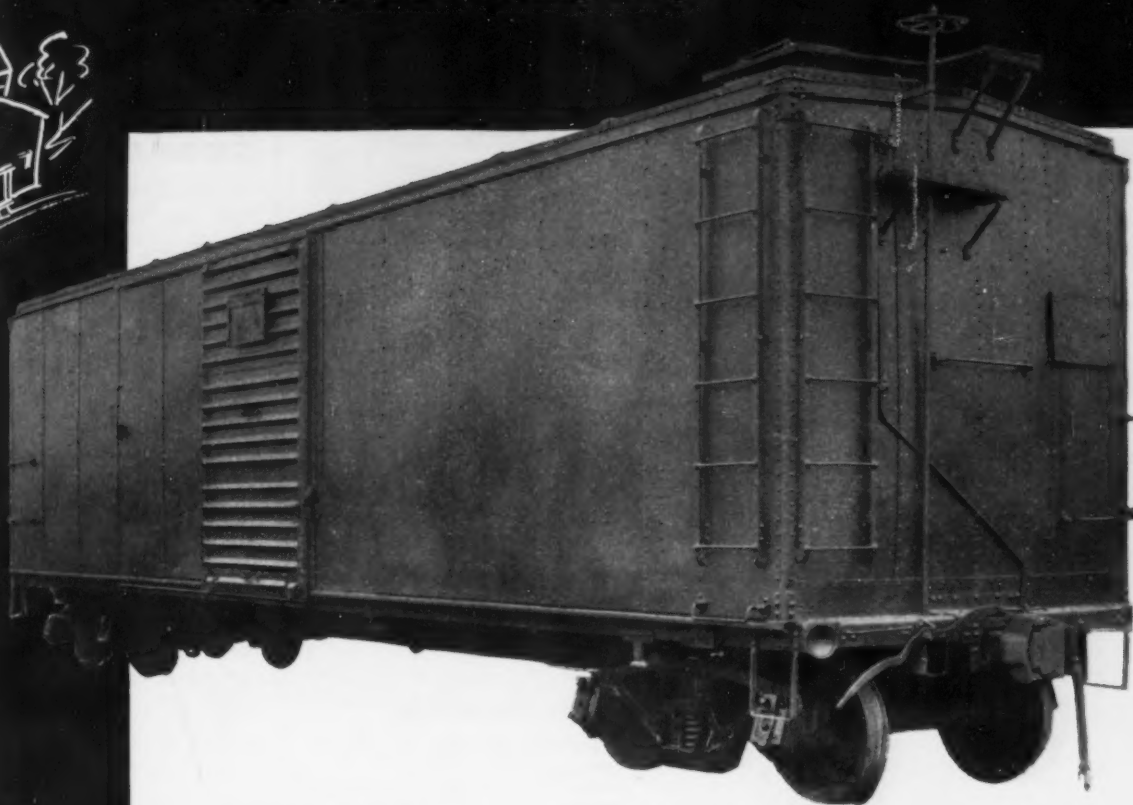
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REPAIRING... in each of CFC's three shops there are the skilled workmen and equipment facilities required to put your old cars into top condition to assure profitable operation.

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Competent engineering service and complete car-building facilities are coordinated to produce your special needs to exacting specifications.

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Wide range of cars for all types of service are available for prompt delivery. Send for specifications of cars on hand.



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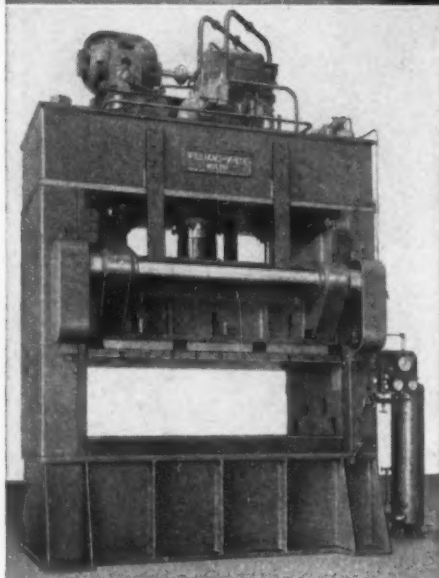
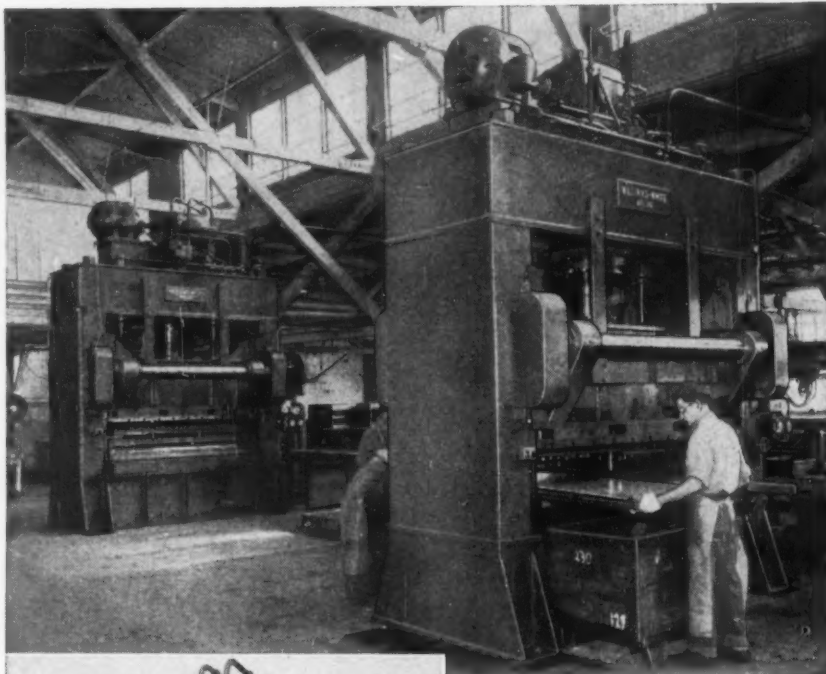
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WILLIAMS-WHITE *Hydraulic Press*

- Capacity, 250 Tons, for efficient forming and blanking operations



- Area of bed, 90" x 54"
- Stroke, maximum 16"
- Rapid traverse, 360" P.M.
- Full pressure, 58" P.M.
- Mechanical paralleling device to permit handling off-center loads
- Hydro-pneumatic cushion
- Knock out bars



The WILLIAMS-WHITE Hydraulic Press, shown above, has been in service for several years turning out stove parts. Equally adaptable to defense material production. For information regarding this and similar machines . . . presses, bulldozers, punches, eye-benders, hammers, etc. . . . write our factory.

MAKERS OF QUALITY PRODUCTION TOOLS FOR NEARLY 100 YEARS

WILLIAMS-WHITE & Co.
703 THIRD AVE., MOLINE, ILLINOIS

publications

Continued

chart. This guide to standard designations and chemical composition ranges for heat and corrosion resistant castings lists 27 standard cast alloy types for service in extremes of temperature and corrosion. The list provides an opportunity to select proven compositions when present critical alloy shortages require choosing a substitute. *Alloy Casting Institute.* For free copy insert No. 35 on postcard, p. 37

Export packaging

A new 20-p. booklet explains in detail the recommended methods of packaging metal parts for shipment. Also included is a list of government specification materials for parts protection on packaging and informative, step-by-step methods for their use. Some of the steps explained are removing rust already present, selection and use of rust preventives, conforming wrap, dip sealing, wrapping the carton and case liners. *Dearborn Chemical Co.*

For free copy insert No. 36 on postcard, p. 37

Forging practice

A series of technical articles on uses of the modern forging machine, together with the latest developments in hot upset forging practices, are being sent out at monthly intervals. Four are currently available, and additional numbers are being written by authorities on the subject. The ultimate purpose is a compendium of modern forging practices. *Acme Machinery Div., Hill Acme Co.*

For free copy insert No. 37 on postcard, p. 37

Nonferrous finishes

A new 4-p. bulletin describes in detail the entire line of Iridite finishes for nonferrous metals. A section of the bulletin also covers the ARP process chemicals, which include brighteners for zinc and cadmium plating and other specialties. Technical data is presented in chart form to explain corrosion resistance, paint adherence, eye appeal and technical advantages. *Allied Research Products, Inc.*

For free copy insert No. 38 on postcard, p. 37

Resume Your Reading on Page 38

IRON AGE *markets and prices*

*market
briefs
and
bulletins*

postponement—Date on which CMP orders will take preference over DO orders has been postponed by NPA to July 7 under Dir. 1 to M-1. Those who have already placed DO orders on steel mills are urged to convert such orders to ACM (authorized controlled materials) status under CMP to expedite September orders. Product limitations for acceptance of rated orders under M-1 will remain in effect with respect to August and September Production.

hot sheet—Some 18 tons of 12 gage hot-rolled sheet swelled the black market steel supply this week. The stock and a 10-ton truck were stolen from the warehouse of Fisher Brothers Steel Corp. of Bronx, N. Y., last week. Thieves seemed to be familiar with the warehouse layout. Police recovered the empty truck on Long Island this week. Herb Fisher estimates the sheet will cost the ultimate consumer 14¢ a lb at black market rates.

lead, zinc—Big place the United States holds as Canadian lead and zinc customer is underscored in a first-quarter report showing 20,371 tons of Canada's 27,482 tons of refined lead exports came here. First quarter exports of zinc contained in ore amounted to 28,178 tons with 24,484 coming to the U. S.

CMP orders—CMP orders to date have been relatively few. But sources close to NPA indicate volume will begin to grow in September. However, an aluminum producer reportedly has been forced to delay some DO tonnage to make room for CMP orders for third quarter.

c-f bar outlook—A Detroit source figures that 14 pct or less of cold-finished bar production will be "free" in third quarter. This is the way he dopes it: A 6 pct loss for conversion, a 30 pct take by warehouses and 50 pct DO.

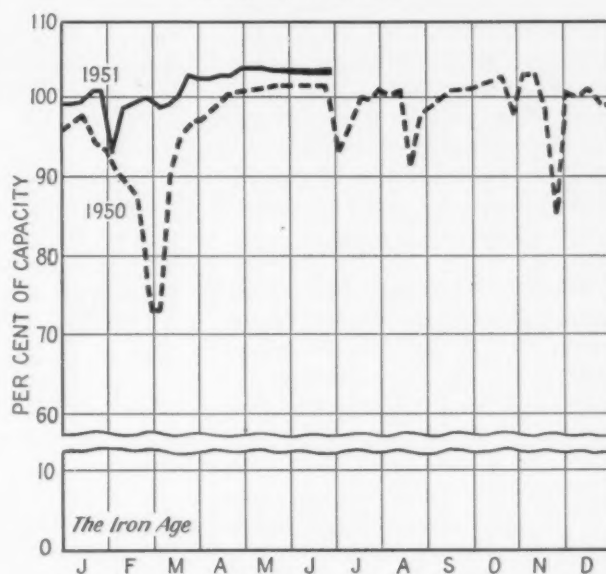
water plant contract—Rust Engineering Co., Pittsburgh, has been awarded a contract to construct a water treatment plant at the Pittsburgh Works of Jones & Laughlin Steel Corp. Plant capacity will be 4000 gallons per minute.

defense deliveries—An estimated \$11 billion worth of military supplies are expected to be delivered in the fiscal year 1951. This figure represents acceptances of finished goods only and does not reflect current buying, work in progress, etc. Rate of deliveries is expected to reach \$38 billion in the 1952 fiscal year.

manganese plant—Manganese, Inc., New York, is building a \$2.5 million manganese ore processing plant at Henderson, Nev. Scheduled completion date is July, 1952. Processing capacity will be 1200 tons of ore per day.

tank track pins—Heavy orders of steel for tank track pins are beginning to show up. Evidently the intent is to stockpile these items for the time when tank production begins rolling.

Steel Operations †



District Operating Rates—Per Cent of Capacity †

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	West	Buffalo	Cleveland	Detroit	Wheeling	South	Ohio River	St. Louis	† East	Aggregate
June 10	102.0*	105.5	96.0	100.5	104.0	104.0	97.5	105.0*	101.0	99.0	95.0	95.0	98.0	103.5
June 17	104.0	106.0	96.0	100.5	104.0	104.0	99.5	104.0	102.0	99.0	91.5	92.0	112.5	103.5

* Revised.

† Beginning Jan. 1, 1951, operations are based on annual capacity of 104,229,650 net tons.

nonferrous metals

outlook and
market activities

NONFERROUS METAL PRICES

	June 13	June 14	June 15	June 16	June 18	June 19
Copper, electro, Conn.	24.50	24.50	24.50	24.50	24.50	24.50
Copper, Lake delivered	24.625	24.625	24.625	24.625	24.625	24.625
Tin, Straits, New York	\$1.23	\$1.18	\$1.11	....	\$1.06	\$1.06*
Zinc, East St. Louis	17.50	17.50	17.50	17.50	17.50	17.50
Lead, St. Louis	16.80	16.80	16.80	16.80	16.80	16.80

*Tentative.

Note: Quotations are going prices.

Tin Tumbles — Reconstruction Finance Corp. has been having difficulty lately in following the nose-diving Singapore tin price. Since June 1 RFC prices and Far East prices have been playing a down-hill game of leap frog which has reduced RFC's quotation from \$1.39 on May 31 to \$1.06 on June 18.

The cuts have been from 5¢ to 7¢ at a clip and have shown little sign of slowing down despite the fact that RFC's Stuart Symington considers a fair price to be about \$1.00 per lb. Cause of the fall has been U. S. abstinence from the Far East market and reduced European buying in anticipation of dropping prices.

Foreign Repercussions — Some trade opinions are that Bolivian tin producers have been losing money since the price dropped below \$1.44 and that production would fall off in that country as a natural consequence. RFC has purchased no Bolivian tin since Mar. 6 when the price was \$1.83 and the contract expired at the end of May. Mr. Symington, however, said on Monday that negotiations have been reopened.

He would not name the figure which was offered to the Bolivians and he did not say whether any reply had been made but he did say that the U. S. has "made an offer to Bolivia which we think

is a very fair offer and that it is substantially higher than 74¢ per lb. We would be willing to buy tin at a price well above the pre-Korea price."

Other Contracts, Too—Yet another opinion heard in the trade is that RFC would not be able to cut off Belgian Congo and Indonesian tin contracts if the price drops below \$1.03. The simple reason given for this is, it is believed, that the contracts cannot be cancelled when tin is selling for less.

Copper Stocks Bounce—Refined copper stocks at the end of May totaled 60,896 net tons, the highest for the past 6 months. Crude production was the highest since March 1944 with a total of 96,825 tons of metal from both primary and secondary sources. Deliveries were also at a high rate during May, according to the Copper Institute.

Chile Outlook Dims—Workers of the Chuquicamata and Potrerillos plants of Anaconda Copper Mining Co. struck last Thursday and at press time it seemed that the other Chilean copper producers would also be hit by the strike. It is thought that the cause of the walkout was a fight between the illegal Communist Party and the Popular Socialist

Party over control of the Chilean Federation of Copper Workers.

The Federation recently made some high demands for wage and bonus increases and executives of the affected companies feel that this is a bid by the workers to get "their share" of the recent 3¢ increase in copper prices. Unless the strike is settled shortly the U. S. is faced with serious consequences in copper.

Dealers Prepared—Metals scrap dealers have been on the edge of their chairs waiting for copper scrap controls for so long that they are getting hardened to it. It's a cinch that none of them will be caught holding the bag with copper in it. Buyers of copper scrap are also waiting and dealers report no orders for delivery later than the end of this month.

It is now reported that Washington is going to issue price orders on copper and brass scrap late this week. It is also expected that the government will permit a 27.5¢ price on copper smelted from Chilean ore. (See p. 109.)

The tin landslide mentioned above has also had its effect on scrap. Dealers' buying prices for block tin have skidded to 85¢ or 90¢ per lb, No. 1 pewter to 60¢ to 65¢, No. 1 babbitt to 50¢ to 55¢, solder joints to 21¢ to 22¢, and siphon tops to 55¢ to 60¢. Otherwise, prices remain unchanged.



by R. Hatschek

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 30,000 lb, f.o.b. ship. pt. frt. allowed)

Flat Steel: 0.188 in., 2S, 3S, 30.1¢; 4S, 61S-O, 32¢; 52S, 34.1¢; 24S-O, 24S-OAL, 32.9¢; 75S-O, 75S-OAL, 39.9¢; 0.081 in., 2S, 3S, 31.2¢; 4S, 61S-O, 33.5¢; 52S, 35.6¢; 24S-O, 24S-OAL, 34.1¢; 75S-O, 75S-OAL, 41.8¢; 0.032 in., 2S, 3S, 32.9¢; 4S, 61S-O, 37.1¢; 52S, 39.8¢; 24S-O, 24S-OAL, 41.7¢; 75S-O, 75S-OAL, 52.2¢.
Plate 1/4 in. and heavier: 2S, 3S-F, 28.3¢; 4S-F, 30.2¢; 52S-F, 31.8¢; 61S-O, 30.8¢; 24S-O, 24S-OAL, 32.4¢; 75S-O, 75S-OAL, 38.8¢.
Extruded Solid Shapes: Shape factors 1 to 5, 36.2¢ to 74.5¢; 12 to 14, 36.9¢ to 89¢; 24 to 26, 39.6¢ to 116¢; 36 to 38, 47.2¢ to 117.0¢.
Rod, Rolled: 1.5 to 4.5 in., 2S-F, 3S-F, 37.5¢ to 33.5¢; cold finished, 0.375 to 3 in., 2S-F, 3S-F, 40.5¢ to 35¢.

Screw Machine Stock: Rounds, 11S-T3, 1/4 to 1 1/2 in., 53.5¢ to 42¢; 1/2 to 1 1/2 in., 41.5¢ to 39¢; 1 9/16 to 3 in., 38.5¢ to 36¢; 17S-T4 lower by 1.5¢ per lb. Base 5000 lb.
Drawn Wire: Coiled, 0.051 to 0.374 in., 2S, 39.5¢ to 29¢; 52S, 48¢ to 35¢; 56S, 51¢ to 42¢; 17S-T4, 54¢ to 37.5¢; 61S-T4, 48.5¢ to 37¢; 75S-T6, 84¢ to 67.5¢.

Extruded Tubing, Rounds: 63-S-T-5, OD in in. 1 1/4 to 2, 37¢ to 54¢; 2 to 4, 38.5¢ to 45.5¢; 4 to 6, 34¢ to 41.5¢; 6 to 9, 34.5¢ to 48.5¢.
Roofing Sheet, Flat: 0.019 in. x 28 in. per sheet, 72 in., \$1.142; 96 in., \$1.522; 120 in., \$1.902; 144 in., \$2.284. Gage 0.024 in. x 28 in., 72 in., \$1.379; 96 in., \$1.839; 120 in., \$2.299; 144 in., \$2.759. Coiled Sheet: 0.019 in. x 28 in., 28.2¢ per lb.; 0.024 in. x 28 in., 26.9¢ lb.

Magnesium

(F.O.B. mill, freight allowed)

Sheet and Plate: FS1-O, 1/4 in., 63¢; 3/16 in., 65¢; 1/2 in., 67¢; B & S Gage 10, 68¢; 12, 72¢; 14, 78¢; 16, 85¢; 18, 93¢; 20, \$1.05; 22, \$1.27; 24, \$1.67. Specification grade higher. Base: 30,000 lbs.

Extruded Round Rod: M. diam in., 1/4 to 0.311 in., 74¢ to 5¢ in., 57.5¢; 1/4 to 1.749 in., 53¢; 2 1/2 to 5 in., 48.5¢. Other alloys higher. Base Up to 1/4 in. diam, 10,000 lb; 1/4 to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangles: M. In weight per ft. for perimeters less than size indicated, 0.10 to 0.11 lb, 3.5 in., 62.8¢; 0.22 to 0.25 lb, 5.9 in., 59.3¢; 0.50 to 0.59 lb, 8.6 in., 56.7¢; 1.8 to 2.59 lb, 19.5 in., 53.8¢; 4 to 6 lb, 28 in., 49¢. Other alloys higher. Base, in weight per ft of shape: Up to 1/4 lb, 10,000 lb; 1/4 to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M. wall thickness, outside diam, in., 0.049 to 0.057, 1/4 in. to 5/16, \$1.40; 5/16 to 3/4, \$1.26; 3/4 to 1, 98¢; 1 to 2 in., 76¢; 0.165 to 0.219, 1/2 to 3/4, 61¢; 1 to 2 in., 57¢; 3 to 4 in., 56¢. Other alloys higher. Base, OD in in.: Up to 1 1/2 in., 10,000 lb; 1 1/2 in. to 3 in., 20,000 lb; 3 in. and larger, 30,000 lb.

Titanium

(10,000 lb base, f.o.b. mill)

Commercially pure and alloy grades: Sheet and strip, HR or CR, \$15; Plate, HR, \$12; Wire, rolled and/or drawn, \$10; Bar, HR or forged, \$6; Forgings, \$6.

Nickel and Monel

(Base prices, f.o.b. mill)

	"A" Nickel	Monel
Sheets, cold rolled	77	60 1/2
Strip, cold-rolled	83	63 1/2
Rods and bars	73	58 1/2
Angles, hot-rolled	73	58 1/2
Plates	75	59 1/2
Seamless tubes	106	93 1/2
Shot and blocks	..	53 1/2

Copper, Brass, Bronze

(Freight prepaid on 200 lb)

	Sheet	Rods	Extruded Shapes
Copper	40.18	..	39.78
Copper, h-r	..	36.03	..
Copper, drawn	..	37.28	..
Low brass	38.47	38.16	..
Yellow brass	37.28	36.97	..
Red brass	38.86	38.55	..
Naval brass	42.27	36.33	37.59
Leaded brass	..	..	35.86
Comm'l bronze	40.18	39.87	..
Mang. bronze	45.77	39.80	41.36
Phos. bronze	59.42	59.67	..
Muntz metal	40.28	35.84	37.09
Ni-silver, 10 pct	48.26	50.59	..
Arch. bronze	..	..	..

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed..... 19.00
Aluminum pig..... 18.00
Antimony, American, Laredo, Tex..... 42.00
Beryllium copper, 3.75-4.25% Be..... 11.56
Beryllium aluminum 5% Be, Dollars per lb contained Be..... \$69.00
Bismuth, ton lots..... \$2.25
Cadmium, del'd..... \$2.55
Cobalt, 97-99% (per lb)..... \$2.10 to \$2.17
Copper, electro, Conn. Valley..... 24.50
Copper, Lake, delivered..... 24.625
Gold, U. S. Treas., dollars per oz..... \$35.00
Indium, 99.8%, dollars per troy oz..... \$2.25
Iridium, dollars per troy oz..... \$200
Lead, St. Louis..... 16.80
Lead, New York..... 17.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb..... 24.50
Magnesium, sticks, 100 to 500 lb..... 42.00 to 44.00
Mercury, dollars per 76-lb flask, f.o.b. New York..... \$210-\$213
Nickel electro, f.o.b. N.Y. warehouse..... 59.58
Nickel oxide sinter, at Copper Cliff, Ont., contained nickel..... 52.75
Palladium, dollars per troy oz..... \$24.00
Platinum, dollars per troy oz..... \$90 to \$93
Silver, New York, cents per oz..... 87.75
Tin, New York..... 1.06
Titanium, sponge..... \$5.00
Zinc, East St. Louis..... 17.50
Zinc, New York..... 18.25
Zirconium copper, 50 pct..... \$6.20

REMETLED METALS

Brass Ingot

(Cents per lb, delivered carloads)

85-5-5-5 ingot
No. 115..... 29.00
No. 120..... 28.50
No. 123..... 28.00
80-10-10 ingot
No. 305..... 35.00
No. 315..... 32.00
88-10-2 ingot
No. 210..... 47.50
No. 215..... 44.50
No. 245..... 37.00
Yellow ingot
No. 405..... 25.50
Manganese bronze
No. 421..... 32.75

Aluminum Ingot

(Cents per lb, 30,000 lb lots)

95-5 aluminum-silicon alloys
0.30 copper, max..... 34.50-36.25
0.60 copper, max..... 34.25-36.00
Piston alloys (No. 122 type)..... 31.00-32.50
No. 12 alum. (No. 2 grade)..... 30.25-31.25
108 alloy..... 31.50-32.00
195 alloy..... 32.50-33.00
13 alloy..... 34.50-36.00
ASX-679..... 31.50-33.25

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97 1/2%..... 32.50-33.50
Grade 2—92-95%..... 31.50-32.50
Grade 3—90-92%..... 30.50-31.50
Grade 4—85-90%..... 29.50-30.50

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, 500 lb lots)

Copper
Cast, oval, 15 in. or longer..... 39 1/2
Electrodeposited..... 33 1/2
Rolled, oval, straight, delivered..... 38 1/2
Forged ball anodes..... 43
Brass, 80-20
Cast, oval, 15 in. or longer..... 34 1/2
Zinc, oval..... 26 1/2
Ball anodes..... 25 1/2
Nickel 99 pct plus
Cast..... 76.00
Rolled, depolarized..... 77.00
Cadmium..... \$2.80
Silver 999 fine, rolled, 100 oz lots, per troy oz, f.o.b. Bridgeport, Conn..... 97 1/2

Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum..... 60.8
Copper sulfate, 99.5 crystals, bbl..... 12.85
Nickel salts, single or double, 4-100 lb bags, frt. allowed..... 20 1/2
Nickel chloride, 375 lb drum..... 27 1/2
Silver cyanide, 100 oz lots, per oz..... 67 1/2
Sodium cyanide, 96 pct domestic 200 lb drums..... 19.25
Zinc cyanide, 100 lb drum..... 47.7

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1/2¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

	Heavy	Turnings
Copper	23	22 1/2
Yellow Brass	20 1/2	18 1/2
Red brass	21 1/2	20 1/2
Comm. bronze	21 1/2	21
Mang. bronze	19 1/2	18 1/2
Brass rod ends	19 1/2	..

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	21.50
No. 2 copper wire	20.00
Light copper	19.00
Refinery brass	19.50*
Radiators	15.00

*Dry copper content.

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to producer)

No. 1 copper wire	28.00-29.00
No. 2 copper wire	25.00-26.00
Light copper	23.50-24.50
No. 1 composition	25.00-25.50
No. 1 comp. turnings	24.50-25.00
Rolled brass	19.00
Brass pipe	20.50
Radiators	19.00-19.50

Aluminum

Mixed old cast	21	—22
Mixed new clips	24	—25
Mixed turnings, dry	21	—21 1/2
Pots and pans	21	—22
Low copper	..	25

Dealers' Scrap

(Dealers' buying prices, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 heavy copper and wire	25 1/2	—26 1/2
No. 2 heavy copper and wire	24	—25
Light copper	22	—22 1/2
New type shell cuttings	22	—22 1/2
Auto radiators (unsweated)	17 1/2	—18
No. 1 composition	22	—23
No. 1 composition turnings	21	—22
Clean red car boxes	19	—19 1/2
Cocks and faucets	19	—19 1/2
Mixed heavy yellow brass	16 1/2	—17
Old rolled brass	18 1/2	—19
Brass pipe	20	—20 1/2
New soft brass clippings	20	—21
Brass rod ends	..	19 1/2
No. 1 brass rod turnings	..	19

Aluminum

Alum. pistons and struts	14	—14 1/2
Aluminum crankcases	17	—17 1/2
2S aluminum clippings	21 1/2	—22
Old sheet and utensils	17	—17 1/2
Borings and turnings	13	—14
Misc. cast aluminum	17	—17 1/2
Dural clips (24S)	17	—17 1/2

Zinc

New zinc clippings	12 1/2	—12 1/2
Old zinc	9	—9 1/2
Zinc routings	5 1/2	—6
Old die cast scrap	6 1/2	—6

Nickel and Monel

Pure nickel clippings	35	—36
Clean nickel turnings	35	—36
Nickel anodes	35	—36
Nickel rod ends	35	—36
New Monel clippings	28	—29
Clean Monel turnings	20	—21
Old sheet Monel	28	—29
Nickel silver clippings, mixed	13	—14
Nickel silver turnings, mixed	12	—13

Lead

Soft scrap, lead	16 1/2	—16 1/2
Battery plates (dry)	9 1/2	—10

Magnesium

Segregated solids	15	—16
Castings	14	—15

Miscellaneous

Block tin	85	—90
No. 1 pewter	60	—65
No. 1 auto babbitt	50	—55
Mixed common babbitt	16	—17
Solder joints	21	—22
Siphon tops	55	—60
Small foundry type	18 1/2	—19
Monotype	17 1/2	—18
Lino. and stereotype	..	17
Electrotype	15 1/2	—16
Hand picked type shells	11 1/2	—11 1/2
Lino. and stereo. dross	9 1/2	—10
Electro. dross	7 1/2	—8

SCRAP *iron and steel*

*markets
prices
trends*

Summer slowup of industrial scrap collections may injure steelmakers' plans of no-vacations . . . Cast supply eases.

Steel producers' resolutions to keep their gates open all through summer, shelving vacation plans, may suffer because industrial scrap sources may narrow down during the hot months. Metal-working plants will probably go in much more heavily for traditional plant layoffs. Further cuts in auto output may put a deep dent in Detroit's industrial scrap supply and NPA allocations may swing to that area more heavily.

The scrap supply situation is so precarious that any slowing of collections, whether from industrial sources or the farm, may upset the applecart.

With the allocation system, if Detroit's supply suffers so does the supply of other steelmaking centers.

OPS will hear further debate on the question of lumping together openhearth grades later this month. The agency also issued a clarifying memo on machine shop turnings recently because of some confusion.

It said: "CPR 5 (iron and steel scrap) does not cover sales between dealers of unprepared steel scrap, but machine shop turnings constitute a prepared grade and as such may not be sold above the ceiling price. Because some users require machine shop turnings to be crushed before direct use does not bring the material within the 'unprepared' classification."

Although the cast iron shortage continues, some easing was reported in Birmingham, Cincinnati, Boston, St. Louis, Chicago, Philadelphia, and New York.

PITTSBURGH—Scrap consumers here are living on a virtual day-to-day basis. For them there is no tomorrow in the accepted sense, because the prospect of

building up any kind of inventory is out of the question. Chief concern of the industry today is what will happen when cold weather comes. It is possible to get by now when scrap is moving freely, but when winter closes in a production cut-back may be necessary.

CHICAGO—Dealer allocations are expected to be increased in the area to take care of mills which are steadily losing inventory. At present most mills in the area are receiving some allocations. Foundries may be in better shape because of the concentration on preparation of foundry grades which bring higher prices. Some foundry inventories have improved and foundries are asking for better quality scrap. Turnings and borings are moving fairly well and there seems to be no acute shortage in these grades.

PHILADELPHIA—Scrap supplies in this district are getting tighter all the time and are now to a point where openhearts may have to cut production within the next few weeks. Pressure is continually being brought to bear on industrial scrap producers to ship scrap back to their steel suppliers. The scrap drive isn't doing much good because anything that would make high-grade scrap is being saved for re-use in the plant. The cast scrap situation is improving a bit but it is still sketchy.

NEW YORK—Scrap men here know they are in a tight to keep up the steel-making rate. Fast footwork in scrap distribution enables them to make best use of the supply—but it's not enough. In these emergency operations brokers shuttle from mill to mill with shipments, filling the greatest need down the line. Manufacturers' vacations may hurt industrial scrap collections later, some fear. They wish the manufacturers had the same determination as steel mills in forgetting vacations. Foundry grades are easing up a little but some of the bigger foundries still have very tough sledding.

DETROIT—Steel mill operations are continuing here at capacity but in the face of steadily dwindling scrap supplies. Some mills, it is reported, are down to 5 and 6 days' inventory. This may be compared with normal of 30 days' supply. Tonnages of scrap being generated in plants are dwindling now and further cuts in auto output are anticipated commencing in July. The question of where the scrap is coming from to continue 7-day steel mill operations in Detroit throughout the summer months is still unanswered.

CLEVELAND—Supply is short and quality less than the best in a relatively unchanged market here and in the Valley. In a few instances, scrap is being held in anticipation of combined grades, according to trade sources, and shipments have tapered off proportionately. Some consumers report they are holding their own on shipments, but are unable to build any inventory. These users have been getting more cars, with less scrap in them. A car of scrap usually averages about 35 tons. Lately, they have been averaging about 20 tons. Grading on cast is being tightened up, but supply remains very short.

BIRMINGHAM—More cast scrap has moved into the district during the past week or 10 days than for some time. Scrap dealers report that shipments from the West, which have practically all been going to the North and East, are now coming here. While the most serious needs have been filled there has not been enough thus far to make foundries feel secure. The steel scrap market continues tight.

CINCINNATI—Movement is good, supply limited and demand terrific here. Openhearth grades are very short and consumers are on the ragged edge inventory-wise. Cast grades are easing somewhat, possibly due to a drop in demand resulting from the plant vacation periods. Labor shortages are hurting production at some local yards.

BOSTON—This week, for the first time in months, foundries in the New England area have been able to increase slightly their sadly depleted inventories. Movement of all grades of iron and steel scrap is active.

ST. LOUIS—Scrap supplies in the St. Louis industrial district are very tight. Allocations are being issued even to truckers. Inventories in hands of melters are said to average 2 weeks' consumption. Hot weather and attention of farmers to field chores rather than scrap collection have slowed accumulation of scrap iron and steel. Cast iron scrap is easing up a bit.

BUFFALO—Dealers report scrap shipments as about normal but mill stockpiles do not gain. One mill planning expansion says it can just squeeze by on current receipts. Another mill has less than a week's supply. Water receipts are good although one mill reports its share of arrivals is not up to expectations.